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SOVIET TANK COMPANY TACTICS

MAY 1976

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This document was prepared by Major A. E. Hemesley QLR of the Ground Forces/MBFR Branch, Soviet/Warsaw Pact Division, Directorate for Intelligence (Research Center), and is released for publication by authority of the Director, Defense Intelligence Agency.

PREFACE

This study of Soviet tank company tactics is written as a "how they fight" manual. Many of the concepts and methods used by the Soviets appear to the US or NATO military reader so alien that there is a temptation to say "This is unworkable." The reader should appreciate that the Soviet tank company commander has a vastly different task than his US or NATO equivalent. His task is to train and lead his company as directed by well established principles set out in field service regulations, and as interpreted by his superiors. The company fights either as part of a battalion size unit, or with the close support of other tank, motorized rifle, and artillery units. The battalion is the basic unit of maneuver in the Soviet Ground Forces and a company is best regarded as a fire team.

The information used in the study has been drawn from a wide variety of sources. In order to ensure wide dissemination some details of equipments have been described in a general manner. In this way the study can be issued as an UNCLASSIFIED document. The reader needing to study equipment details has been provided with basic data in the enclosures. It should be noted that equipment differs from one Soviet unit to another and there are also minor differences in personnel manning levels. The study is written using a type organization and manning level which is defined in the text.

CONTENTS

EXECUTIVE SUMMARY

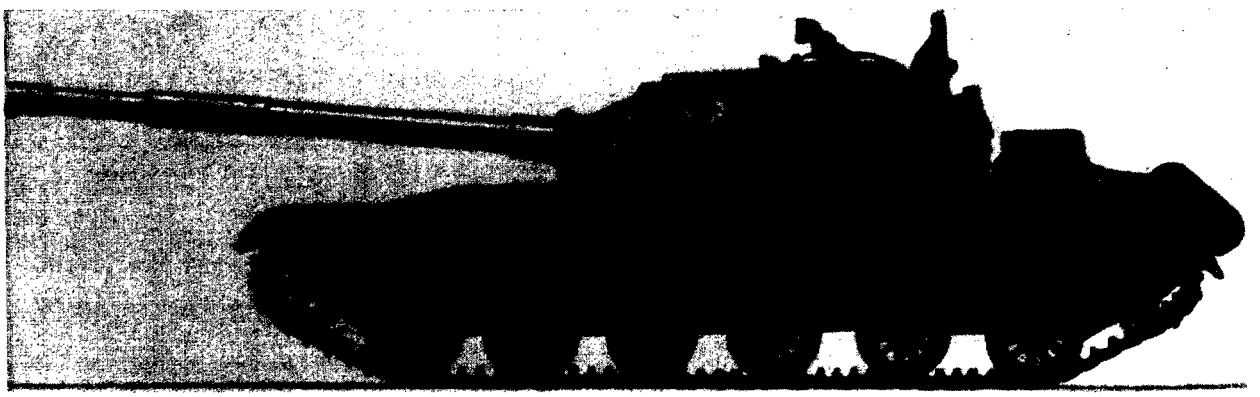
The Soviet tank company is equipped with either 10 or 13 tanks, according to its subordination, and is organized into three platoons. Its personnel consists primarily of conscript soldiers generally well trained in the individual skills of driving, loading, and gunnery. Four tank commanders in each company are officers or warrant officers who complete extensive professional training. The remaining tank commanders are conscripts who have six months training before arriving in the company and train in their units during the next 18 months until their term of service expires.

Tank companies are equipped at present with tanks which are simple to operate, have low silhouettes, good mobility, and an accurate gun limited by its optics to a range of fifteen hundred meters. Limitations in target acquisition and sighting equipment mean that night firing is restricted to a range of about roughly half the daytime range.

The Soviets consider that the tank company is a single fire unit. It can reinforce other combat arms or be reinforced. It normally operates as an independent unit in reconnaissance, as a security detachment, or when used as the basis for a motorized rifle battalion's antitank defense. In other tactical operations the tank company is subordinated to a larger unit.

Tactical training consists primarily of rehearsing changes in column and line formations at platoon and company levels. Fire control is exercised by the company commander except in emergencies. Antitank guided missiles and enemy tanks are regarded as priority targets. Tanks fire on the move or at short halts, and fire is concentrated against a single target if the company commander considers its a particular threat. The company assaults an enemy formation or position after artillery has provided fire support, whenever possible. Control and communications security is strict, and platoon and company commanders are expected to lead and show initiative, but within the limits set by field regulations.

Soviet tank tactics, which we believe are sound, emphasize concentrating against a poorly prepared enemy, attacking without lengthy preparation, and rapidly exploiting success. Training of tank crews in such skills as driving, gunnery, and maneuvering in combat formations is effective. However, junior officers and tank commanders do not have sufficient opportunity to develop the initiative needed to respond effectively to rapidly changing combat situations. Overall, we judge that the Soviet tank company is capable of completing operational missions and that, in combat, its success would be determined by force ratios, enemy effectiveness, and other external factors.



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CHAPTER 1

INTRODUCTION

1. PURPOSE. This study presents information on the tactics of the Soviet medium tank company. Tactical information is preceded by data on equipment, tank crew training, and organization. The study is primarily intended to provide instructors at schools and in field units with reference material. Key facts are repeated to make each section self supporting.

2. SCOPE.

a. The medium tank company is the basic building block of the Soviet tank arm. Normally, a tank company will operate as part of a battalion-sized unit and be supported by, or in support of, other arms. Although this study refers to combined arms operations, only the techniques and tactics of the tank component are analyzed.

b. The study examines company and platoon tactics in a European setting in both nonnuclear and nuclear environments. Soviet tactical terminology and symbology have been used when U.S. terminology fails to adequately describe Soviet concepts, organization, and tactics. Unless otherwise stated military terms in common use have the meaning given to them in JCS Publication 1 dated 3 Sep 74. Soviet terms which have no US equivalent are defined when first used.

c. In the tactical diagrams the reader should assume that radio communications exist between each vehicle depicted. Frontages used in the diagrams are for nonnuclear operations. In nuclear operations these frontages can generally be doubled.

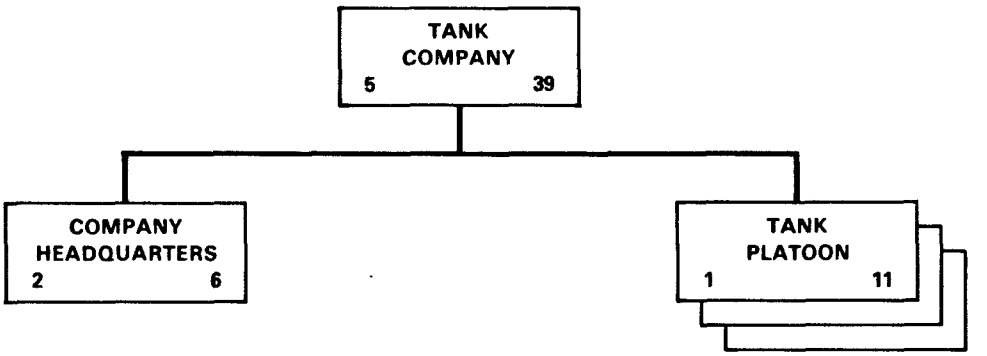


Figure 1a. Organization of a Tank Company (Tank Division).

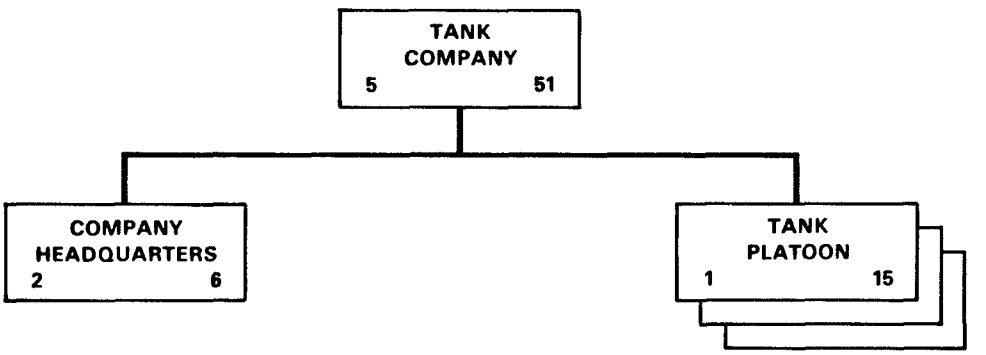


Figure 1b. Organization of a Tank Company (Motorized Rifle Division).

CHAPTER 2

ORGANIZATION, COMMAND AND CONTROL

Section A Organization

1. THE TANK COMPANY AND PLATOON. The tank company consists of three tank platoons and a company headquarters. In a tank battalion subordinate to a tank regiment, the platoon consists of three tanks. In a tank battalion subordinate to a motorized rifle regiment the platoon consists of four tanks. In an independent tank battalion subordinate to a division the platoon consists of four tanks.

2. THE TANK CREW. The crew of a Soviet medium tank is normally four. The duties of the tank crew are:

a. The commander is in immediate command of a tank. The company commander and platoon leaders command their own tanks. Tank commanders' responsibilities include maintenance of the vehicle, target acquisition, fire control, the selection of firing positions, and resupply. The commander is the only crew member trained and authorized to use the tank radio except in emergencies.

b. The gunner is second in command of the tank. He is responsible for firing, servicing, and repairing the tank's main gun and maintaining the tank's optical and gunnery instruments. He assists the driver-mechanic in the technical inspection of the vehicle, and replaces the ammunition. In combat the gunner assists in target acquisition and selects the correct ammunition for each target. He fires the main gun and the coaxial machine gun.

c. The driver-mechanic's duties include maintenance and repair of the tank, obtaining spare parts, and inspection of the vehicle. In combat the driver-mechanic is responsible for selecting a route which presents the gunner with good firing positions.

d. The loader is responsible for the condition and storage of ammunition and for maintenance of the machine guns. He assists the gunner in preparing the main gun for combat, aids the driver-mechanic in routine maintenance and assumes the duties of the gunner if necessary. He also mans the antiaircraft machine gun if there is one mounted on the tank. In understrength units there may be no loader in tanks other than those of the company and platoon commanders.

e. There is little evidence of formal cross training within the tank crew. Soviet tank crewmen are likely to be familiar with some of the operating procedures of fellow crewmen and could probably perform the tasks required in an emergency. In some tank units the commander encourages efforts at cross training.

The Tank Crew. The wire from the helmets are for attachment to the intercommunication system. Note the apparent youth of all four crewmen.

Section B Command

3. COMPANY COMMANDER. The tank company commander, normally a captain or senior lieutenant, is responsible to the battalion commander for the command and efficiency of his company. He is responsible for the accomplishment of the assigned mission and fire control of his company during operations. Before and after combat he is responsible for the maintenance and servicing of the vehicles and the combat readiness of the company and the standard of crew and tactical training. In combat the responsibilities of the company commander include:

a. Deployment; camouflage; maintenance; and replacement of ammunition, fuel, lubricants, and food.

b. Issuing tactical, political, and preparatory orders.

c. Estimating the situation and carrying out reconnaissance with subordinate and attached unit commanders.

d. Formulating coordinating instructions, issuing orders, and supervising inspections prior to commitment.

e. Leading or directing the company during operations, controlling the fire of company tanks, and attached units during execution of the mission, maintaining contact with flank units, and reporting tactical information to the battalion commander.

4. COMPANY HEADQUARTERS. Company headquarters consists of:

a. Deputy commander - a senior lieutenant or lieutenant, who is the political officer.

b. Technical officer - a senior lieutenant or lieutenant who has three or four years training at a higher tank technical school.

c. A *praporshchik* - (a rank roughly equivalent to a US warrant officer) who attends to routine administrative matters.

d. A tank crew consisting of a driver-mechanic, a gunner and a loader.

The headquarters officers and *praporshchik* do not accompany the tanks on their combat missions. There is also a truck driver and a clerk.

5. PLATOON LEADERS. Platoon leaders are normally lieutenants, but may sometimes be *praporshchiki* or, rarely, sergeants. The authority of the platoon leader in company operations is limited. His task is to lead his platoon in the execution of the company mission, not to translate his superiors' orders into a platoon mission. When attached to a motorized rifle battalion, especially in defensive operations, platoon leaders may be allowed more flexibility in the execution of their mission.

Section C Control

6. CONTROL MEANS. The company commander controls the tank company by radio, visual and audio signals, and pyrotechnics, in the employment of well rehearsed tactical drills. Only officers carry maps. Reference points are used for identification of terrain features. Personal example is regarded as a control technique, and company and platoon commanders are expected to personally lead their subunits when the situation demands it.

7. RADIO NETS. The tank company commander has two radios in his tank: a very high frequency (VHF) set for communications with the company and a high frequency (HF) set for communications with the battalion commander and other tank companies. In the tank company the company and platoon commanders net with each other and the commanders of attached motorized rifle and artillery units. Normally, radios in tanks other than command tanks are operated only in the receiving mode. Supporting artillery commanders can communicate directly to all company tanks.

8. CONTROL LEVEL. It is important to note that control of the command radio net is retained at battalion level, and when the company operates as part of a battalion there will probably be no company net, but all tanks will monitor the battalion net and receive orders from the battalion commander.

9. RADIO SECURITY. The tank company, in common with other Soviet units, is forbidden to make radio transmissions immediately before contact is made with the enemy. Radio sets are operated on listening silence until contact has been made. During combat, only the company commander is authorized to transmit on the company frequency. Transmissions are short and kept to a minimum. Platoon leaders are allowed to transmit only in emergencies. In combat, orders and tactical reports are transmitted in the clear while references to terrain features and other units are encoded.

10. VISUAL AND AUDIBLE SIGNALS. Prior to combat, normally during the commander's reconnaissance, codewords are assigned to prominent terrain features within company boundaries. Pyrotechnics or tracers are used in combat to identify targets, boundaries, and units. Prearranged audible signals are used for warnings when the company is in a static position. Land lines are used to communicate between tanks and between supported and supporting arms while in static defensive positions.

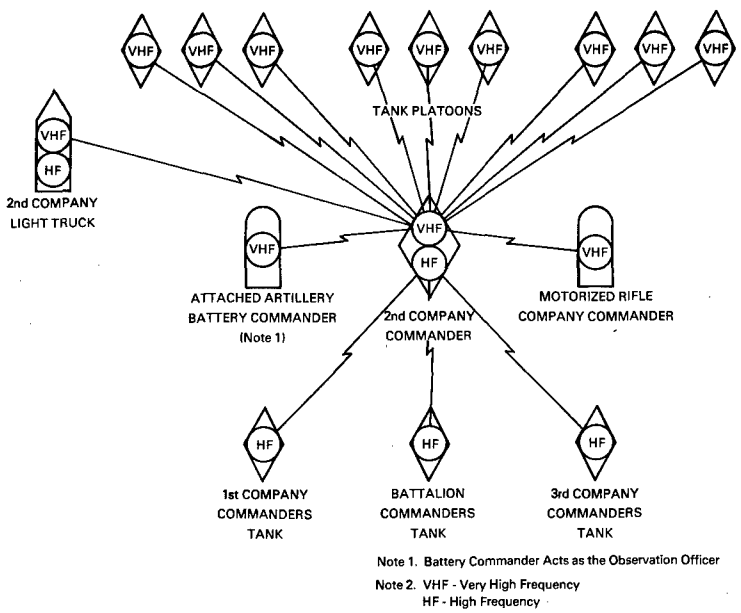


Figure 2. Representative Radio Net of a Tank Company.

CHAPTER 3

WEAPONS, EQUIPMENT AND SERVICES

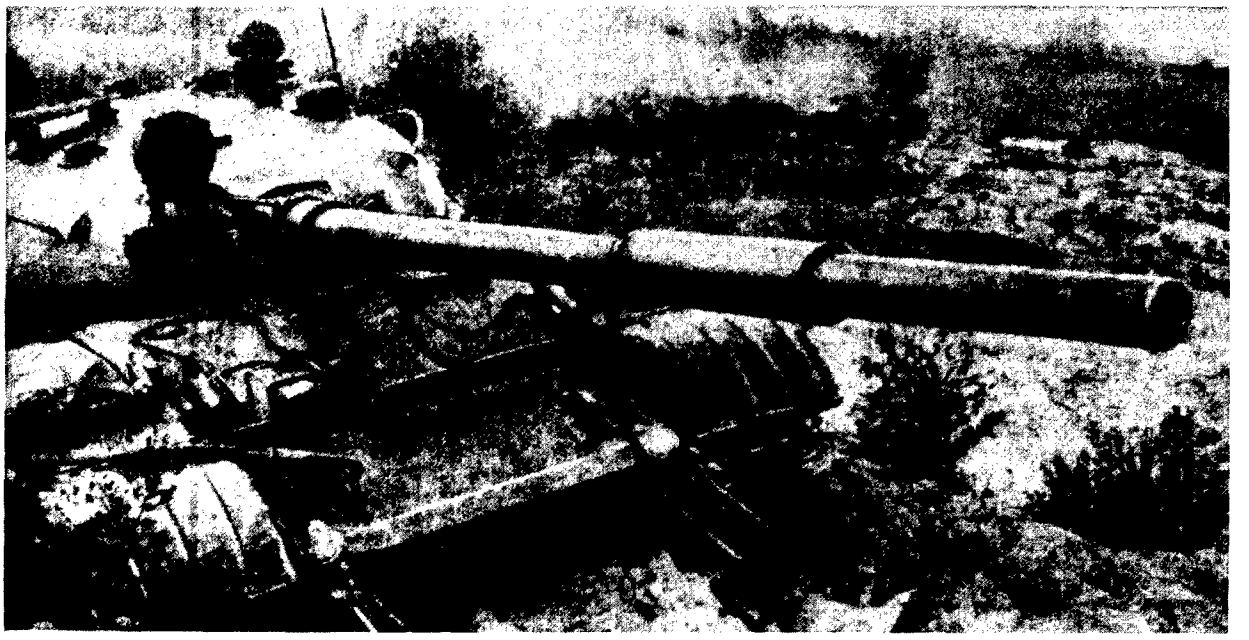
Section A Weapons and Equipment

1. WEAPONS. Equipment and weapons in the Soviet tank company are durable and being improved through continuing research and development. The Soviets expect tank units to fight by day and night, in extremes of climate, and in a nuclear and chemical environment. Technical details of tanks, and data on equipment and individual weapons currently in service with the Soviet tank company, are in enclosures 1 and 2. Details of navigation and night viewing devices used in tanks are in enclosure 3.

2. SPECIAL PURPOSE TANK EQUIPMENT. Soviet medium tanks can all be provided with auxiliary parts for attaching the mine plough, the plough and roller combination, and the tank bulldozer blade. The weight of these items reduces the tank's obstacle crossing ability and maneuverability and makes the vehicle more difficult to handle. The engine life of tanks having this special equipment attached is also reduced. The detrimental effects of the use of such special equipment are judged sufficiently severe to inhibit frequent training.

3. COMPANY TRUCK. One light truck is held in the tank company. This vehicle is used by the deputy company commander, the technical officer, and the *praporshchik*. The vehicle is equipped with a radio which can be used as a communications link from the company commander's tank to the battalion headquarters when the tank company is out of direct communications range.

4. CBR EQUIPMENT. All personnel have individual protective masks, and most modern tanks are probably equipped with air filtration systems. Decontamination of vehicles is carried out under supervision and with the aid of chemical defense specialists. CBR defense is dealt with in detail in Chapter 8. Soviet tanks have a smoke generating system for providing a defensive smoke screen when required.



T62 fitted with mine plows.

5. SUPPLY AND MAINTENANCE PLATOON. The commander of the supply and maintenance platoon of the tank battalion coordinates the resupply of tank companies. There is, however, no evidence of an administrative net for his use within the battalion. This could cause considerable difficulty in resupply when the companies are widely separated from battalion headquarters.

6. TRANSPORT AND SUPPLY.

a. The organic trucks of the tank battalion are supplemented for operations by the tank regiment. Specialized unarmored tracked transporters are available in some units for the medical section and the supply and maintenance platoon to evacuate casualties and carry ammunition. Fuel trucks resupply the company as required.

b. Tank companies are resupplied in the battalion assembly area with POL and ammunition prior to combat. Main and auxiliary fuel tanks are filled to capacity for approach marches. the 200-liter auxiliary fuel tanks are dropped prior to combat, picked up by the supply and maintenance platoon, and returned to tanks on the objective. The basic load, known to the Soviets as "ammunition unit of fire," for tanks is listed below.

WEAPON		TANK	RDS PER UNIT OF FIRE PER TANK
7.62mm MG	(2 ea)	T-54	5000 rds
	(2 ea)	T-55	3500 rds
	(1 ea)	T-62	2500 rds
	(3 ea)	JS-2	2100 rds
	(1 ea)	JS-3	1500 rds
12.5mm MG	(1 ea)	T-54	250 rds
	(1 ea)	T-55	250 rds (optional wpn)
	(2 ea)	T-10	744 rds
	(1 ea)	JS-2	250 rds
	(1 ea)	JS-3	250 rds
14.5mm MG	(2 ea)	T-10M	744 rds
100mm Main Gun		T-54	37 rds
		T-55	44 rds (avg)*
115mm Main Gun		T-62	40 rds
122mm Main Gun		T-10/T-10M	30 rds
		JS-2/JS-3	28 rds

*The T-55 can carry from 38 to 47 rounds of 100mm ammunition for the main gun. About half would be antitank (HVAP-T) and the other half HE and fragmentation rounds (FRAG-HE). The average number of on-board rounds is 44.

c. Resupply in combat is normally at night; each tank company is resupplied in turn. If a tank runs out of ammunition during combat it moves to a position outside enemy observation and is resupplied. In defensive positions ammunition may be placed near the tank position to provide a ready reserve.

d. An emergency reserve consists of between 20 percent and 30 percent of the normal load of POL, rations and ammunition, and all spare parts carried in company tanks. This reserve may not be used without orders from the company commander.

7. MAINTENANCE AND RECOVERY.

a. Basic maintenance of tanks is carried out by tank crews supervised by the company technical officer and tank commanders. Identified faults are rectified on the spot if possible. The low standard of training of the driver-mechanic and lack of equipment in the company preclude extensive repairs.

b. In combat, a recovery and repair organization is established at battalion level. A technical observation point (TOP) is formed by battalion and company technical officers and is normally mounted in an APC. The TOP moves in rear of battalion headquarters with the task of maintaining visual surveillance over the battlefield to locate damaged tanks. The TOP is in radio communication with the battalion commander and monitors the command net to identify damaged and inoperative tanks. Communications are also maintained with the chief of services at regimental headquarters. There is one armored recovery vehicle (ARV) in each medium tank battalion.

c. Tanks damaged in combat are repaired on the spot or under the nearest cover by the battalion repair and evacuation group (REG). The REG is formed by the battalion maintenance section with augmentation from regiment as required. It follows the tank battalion and is tasked by the TOP.

d. Tanks damaged beyond the repair capability of the REG are recovered and evacuated by regimental or division maintenance units. Crews remain with these tanks and assist in making repairs and are thus lost to the company commander until repairs are made. It should be noted that the Soviets normally replace entire units rather than make individual vehicle or crew replacements.

8. MEDICAL. First aid is administered to battle casualties by other members of the crew, using the first aid pack in the tank. The battalion medical team which accompanies the REG removes serious casualties from tanks once they have been towed to cover. Serious casualties are collected and evacuated by regimental transport, as there is no medical officer at battalion level.

Routine maintenance is carried out by the driver mechanic and crew under the supervision of the Company technical officer.

CHAPTER 4

SOVIET TANK CREW TRAINING

1. CREW EFFECTIVENESS. The effectiveness of the tank company depends on the quality of individual and crew training. This chapter describes the type of training which members of a tank crew receive.

2. CONSCRIPT TRAINING. The majority of men in a Soviet tank company are conscripts. The percentage of professional soldiers at this level varies but will seldom exceed 10 percent. Conscript tank commanders, gunners and driver-mechanics complete a period of four to six months instruction in training units before joining their companies. Loaders receive no specialist training and join their companies after one month of instruction. Most conscript tank crewmen will have received pre-induction training before entering the Soviet Army. This training is given by military instructors at schools, factories, collective and state farms, and institutes in the USSR. The standard of pre-induction training varies widely throughout the USSR.

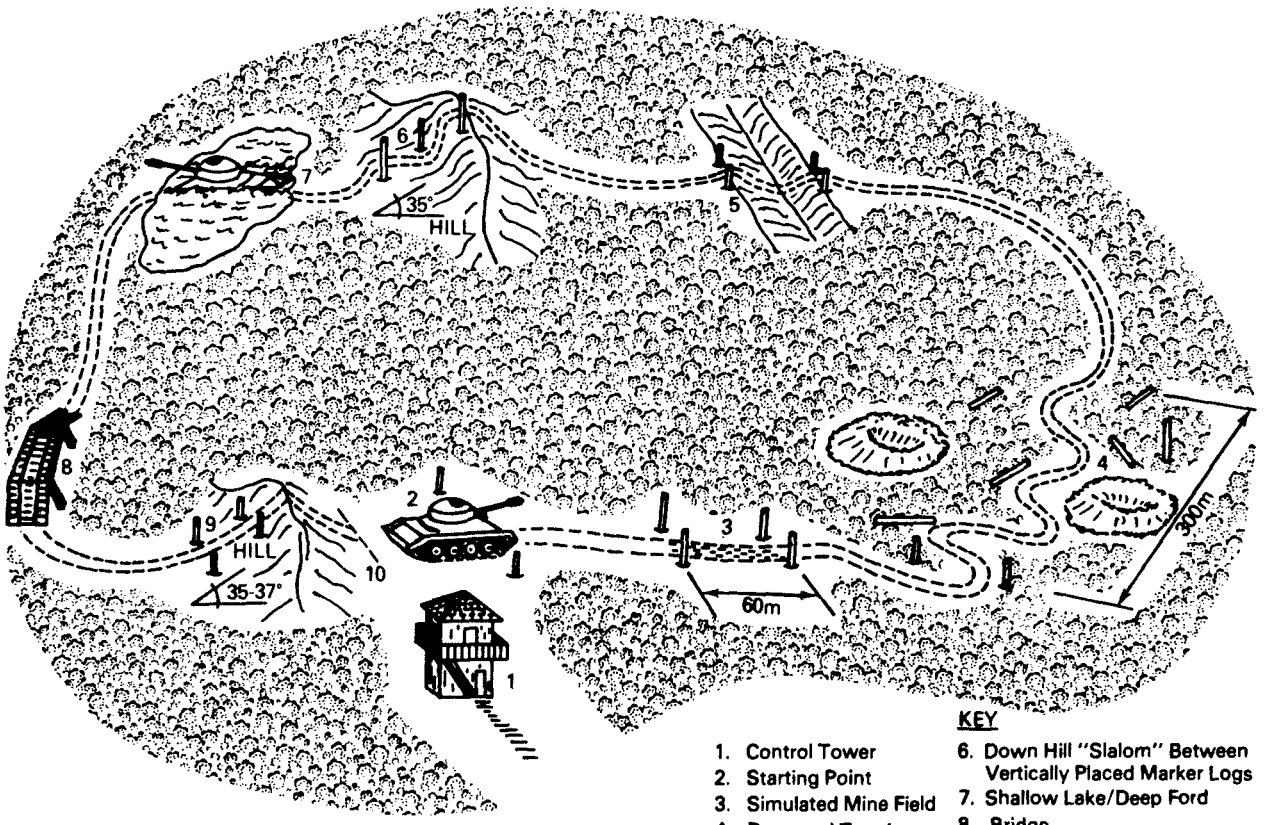
3. TRAINING OF JUNIOR LEADERS. At least one tank commander in each platoon is a junior officer or *praporshchik*. The officer has received up to four years' training in officer schools, and a *praporshchik* has received between six months and a year's professional training following two years experience as a conscript.

4. ROTATION OF CONSCRIPTS. Conscripts are inducted into the Soviet Army at six month intervals and serve for two years. This means that approximately 22 percent of a combat unit changes every six months. Non-specialists join tank companies at the same time as specialists. Many regimental commanders reassign experienced crewmen every six months to spread expertise.

5. TANK CREW TRAINING. Soviet tank crews are trained on controlled driving and firing ranges. The emphasis in driver training is on safely overcoming a timed series of driving hazards and providing the gunner with a good sight picture. Obstacles on a typical driving course include hills, bridges, steep slopes, curves, ramps, and a deep fording obstacle (see Figure 3). The gunner is required to accurately fire the main gun and the machine gun both from static positions and on the move.

6. EQUIPMENT CONSERVATION. To conserve equipment for combat, tank companies normally use only one or two tanks for training. Remaining tanks are kept in storage and periodically rotated with training tanks and are normally used only for large scale exercises. Storage maintenance standards are high, but excessive and inexpert maintenance of stored tanks probably does more harm than good. The equipment conservation system does not consistently insure the mechanical reliability of the company's tank inventory. The training of crews whose tanks are storage is probably less effective than that of crews having training tanks.

7. SUBUNIT TRAINING. Training by companies and platoons concentrates on firing, driving, and rapidly shifting combat formations. About 30 percent of this training is at night. In recent years there has been some combined training of tank and motorized rifle elements. Training is mainly a repetition of standard drills with little opportunity for junior commanders to use initiative.



KEY

1. Control Tower
2. Starting Point
3. Simulated Mine Field
4. Damaged Terrain
5. Antitank Ditch
6. Down Hill "Slalom" Between Vertically Placed Marker Logs
7. Shallow Lake/Deep Ford
8. Bridge
9. Uphill Slope
10. End of Course

TOTAL LENGTH OF COURSE IS APPROXIMATELY 8 kms.
TIME ALLOWED FOR A CIRCUIT IS 21 MINUTES.

Figure 3. Tank Driver Training Course.

Driver training concentrates on safely overcoming a series of hazards such as that shown on an obstacle course. A strict time limit is imposed for completion of the course.

CHAPTER 5

TANK GUNNERY AND FIRE CONTROL

Section A Gunnery

1. GUNNERY METHODS.

a. Emphasis is placed on fast, accurate, and intense fire from the main gun and machineguns during combat operations. Tank gunners fire from "in place" positions, at short halts of 15 to 45 seconds, on the march, and while fording water obstacles. A great deal of training time in tank companies is spent using simulators and sub-caliber devices to improve gunnery techniques. Firing on the range is frequent by day and night using the 23mm sub-caliber device and the tank machineguns.

b. Tank company officers and tank commanders are required to be proficient with the tank's armament, and officers are used extensively as gunnery instructors. Tank commanders qualify as gunners as part of their training, and conscript commanders can earn incentive pay through their skill as gunners.

2. INITIAL GUNNERY TRAINING. Basic gunnery training for the conscript is divided into theoretical and practical work, with emphasis being placed on the latter. Upon the completion of training the gunner is given an oral examination on the theoretical side of his training. He also fires three rounds of 23mm sub-caliber training ammunition and 70 rounds from the tank machinegun "for the record" to obtain a proficiency rating. Trainees do not fire for the record before their instructors are satisfied that they can perform every detail of the gunnery routine without difficulty.

3. GUNNERY STANDARDS. The standards for gunnery proficiency are common throughout the Soviet tank arm. A graded test is taken once a year. Targets are provided at ranges of 400m to 1200m for main armament and machineguns. Three rounds from the main armament, usually of 23mm sub-caliber ammunition, have to be fired within 100 seconds. Machinegun targets appear twice before and twice after the main target. Ratings are as follows:

Superior:	Three hits with 23mm and at least one hit on one machinegun target, or two 23mm hits and all machinegun targets hit.
Excellent:	Two 23mm targets hit and three machinegun targets hit, or one 23mm target hit and all machinegun targets hit.
Good:	Two 23mm targets hit and one machinegun target hit, or three 23mm hits and no machinegun targets hit.
Pass:	One 23mm target hit and several hits on one machinegun target.
Fail:	One 23mm target hit and no machinegun targets hit, no 23mm hits and all machinegun targets hit, or no hits with either.

Tank commanders normally fire three rounds of armor piercing each year for familiarization.

4. GUNNERY RANGES. Tank ranges are usually situated near tank units. They normally consist of up to ten target lanes and a single return lane, down which tanks move in column after firing. Orders for firing are relayed to the platoon commander from a central control tower by radio. Targets range from 400m to 1200m and are old vehicles, popups, or moving silhouettes of tanks, APCs, or infantry. Tanks engage targets on order of the platoon commander. Approximately 25 percent of range firing is at night. Targets are illuminated either by searchlights or by flashing bulbs attached to the targets. Using the night sight and the infrared search light, firing is conducted up to a range of 800m.

Section B Fire Control

5. FIRE CONTROL ON OPERATIONS. In a company operation, the company commander controls the fire of each tank by radio. Tank fire is concentrated upon targets according to the priority assigned by the commander. Antitank guided missiles (ATGM) are first priority targets. In the assault, tanks engage the target which is closest and most dangerous to them. Targets are indicated by use of encoded terrain reference points, by tracer fire, by the commander pointing his gun at the target, or by use of the target azimuth scale. The company or platoon commander gives a fire mission containing the following elements:

a. Call sign of unit or tank to fire.

b. Target location by use of reference point.

c. Fire mission: destruction or neutralization.

d. Firing procedure: fire from march, short halt, etc.

e. Type of round: AP, HE, fragmentation.

f. Number of rounds to be fired or when to cease fire.

6. GUN STABILIZATION. Soviet tanks have had some method of gun stabilization since 1958. Tanks produced subsequently have both vertical plane and azimuth stabilization. While the Soviet concept calls for tanks to fire on the move, the stabilization system is space oriented rather than target oriented. The rough ride resulting from the relatively crude suspension system means that target stabilization is probably not yet possible in the T54-T62 series. Therefore, the chance of a first round hit still depends on the skill of the gunner rather than on the efficiency of the stabilization system.

7. ACCURACY. The accuracy of Soviet tank gun systems appears to be limited by their sighting mechanisms, range finders, and gunnery techniques, rather than by capabilities of the guns and ammunition. We assess the accuracy of the 100mm gun of the T54/T55 as being high to 1000m after which it falls off rapidly. The T62 with the 115mm gun using high velocity fin stabilized armor piercing discarding sabot (HVFSAPDS) ammunition is accurate and has a good penetration capability at ranges up to 1500m. Reduction in tube life in the main armament and the high cost of full bore ammunition explains the frequent use of the 23mm sub-caliber device in gunnery training. In night gunnery the IR system presently in use presents sighting problems. The most effective method of engaging targets at night is illumination by white light and engagement using the daylight sight.

The gunner in T55 with the breech block of the gun in the foreground. The gunners' left hand is on the rangefinder to the left of which is the night sight.

CHAPTER 6

SOVIET CONCEPTS AND MISSIONS

1. CONCEPTS.

a. The basic tactical concept of the Soviet Army is offensive action. This calls for Soviet forces to break through gaps in enemy defenses and to rapidly exploit in strength and depth. Soviet military writings state "mobility and high tempos of combat operations bring success in a battle or operations." Defense is regarded as a temporary expedient until a favorable situation for a return to the offensive can be created.

b. Tank units have a critical role in Soviet tactical doctrine due to their mobility, maneuverability, and speed. These qualities are stressed by the Soviets more than the armor protection and firepower inherent in the tanks.

c. The Soviets regard the tank arm as the basic striking force of their ground forces, and stress the necessity for rapid maneuver of tank units to exploit the effects of nuclear, chemical, or conventional artillery fire. Tank and motorized rifle units may be cross attached as the mission requires. Rapid changes in mission are an integral part of Soviet tactical concepts.

d. Tank company operations are usually launched from the march column. Initiative and resourcefulness are recognized as being qualities needed by the tank unit commander in the execution of his mission. Strict adherence to tactical formations is, however, required within the company.

e. Trafficability of the tank can restrict mobility, but it should be noted that tank crewmen are trained to cross water obstacles by snorkeling in addition to bridging and ferrying. Soviet tank crews are trained and equipped to operate in nuclear and chemical environments.

2. ECHELONS AND RESERVES. In strict Soviet terms "echelons" are not used below regimental level. The first echelon will be given primary objectives. Second echelons are initially assigned objectives which may be altered after crossing their line of departure. A reserve is not initially assigned a mission and can be used by the commander at the decisive moment of an operation. A tank company can be assigned tasks in either first or second echelons. Suitably reinforced a tank company can be employed as a regimental reserve. Its method of operation will remain the same in any of these roles.

3. MISSIONS.

a. As a rule, tank companies operate as part of a tank battalion; however, when reinforced by tactical units of other ground forces, they are capable of independent operations. Missions of a tank company, as part of a tank battalion or in conjunction with other units are:

(1) Reconnaissance.

(2) March security.

(3) Advance guard.

(4) Attacks from the march column.

(5) Deliberate attacks against prepared and hasty defenses.

(6) Meeting engagements.

(7) Forcing or crossing water obstacles.

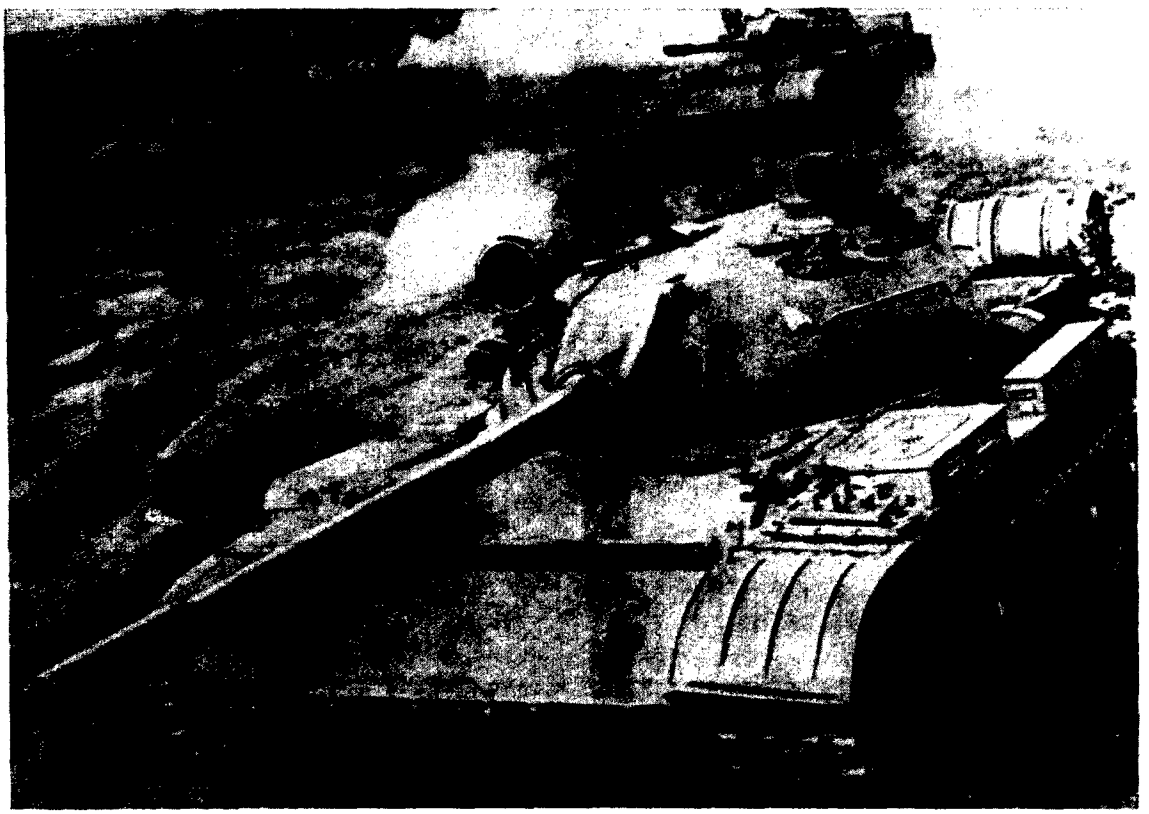
(8) Defensive operations.

b. When tank companies reinforce motorized rifle units, their missions are:

(1) To provide additional antitank firepower.

(2) In defense, to provide an armored reserve.

(3) To lead attacks.



"The basic tactical concept of the Soviet Army is offensive action" T54/55's in the Assault.

CHAPTER 7

TACTICAL FORMATIONS

1. GENERAL.

a. During combat operations the tank company moves in well rehearsed formations appropriate to the mission. The place of each tank in the platoon and company is fixed. Tank companies train for the orderly and rapid redeployment from march and for precombat and combat formations. This training is inspected periodically by staff officers and commanders from regiment who judge the company's proficiency in executing the formations.

b. Signals to deploy or change formation are usually given by flag or hand during the march or in precombat situations and by radio codewords after contact has been made. Navigation is carried out by officers, as enlisted men are not issued maps. The following diagrams show the usual position of tanks in formation.

2. MARCH FORMATION. During the march a tank company moves as quickly as possible on roads in column formation. The company commander leads the column and platoons follow in numerical order (see Figure 4).

3. PRECOMBAT FORMATIONS. Companies move in differing configurations of platoon column, depending on the terrain and the direction of the threat. These are called precombat formations and are used to achieve dispersion when near the enemy or crossing minefields. The first platoon by numerical designation within the company is known as the guide platoon (see Figure 5).

4. COMBAT FORMATIONS. Combat formations are determined by the terrain and the threat. Basically, tanks are formed in line with the company commander behind the line to be in position to control his command.

a. The company assaults in combat formations at maximum speed. In combat line there is 100m between tanks. The company commander travels no more than 300 meters behind the guide platoon commander (see Figure 6).

b. To add depth to an assault, the "two up" formation may be used (see Figure 7). In the "two up" formation tanks are echeloned so that all may fire in the assault. A similar formation exists with only one platoon up. In such a case the guide platoon leads.

c. To protect an exposed flank an echelon formation is used (see Figure 8). A similar formation exists for the tank company to be echeloned right (see Figure 8).

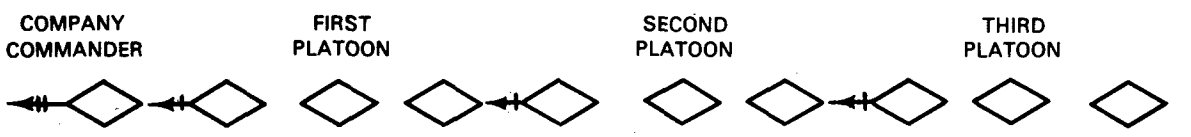


Figure 4. Tank Column in March Formation

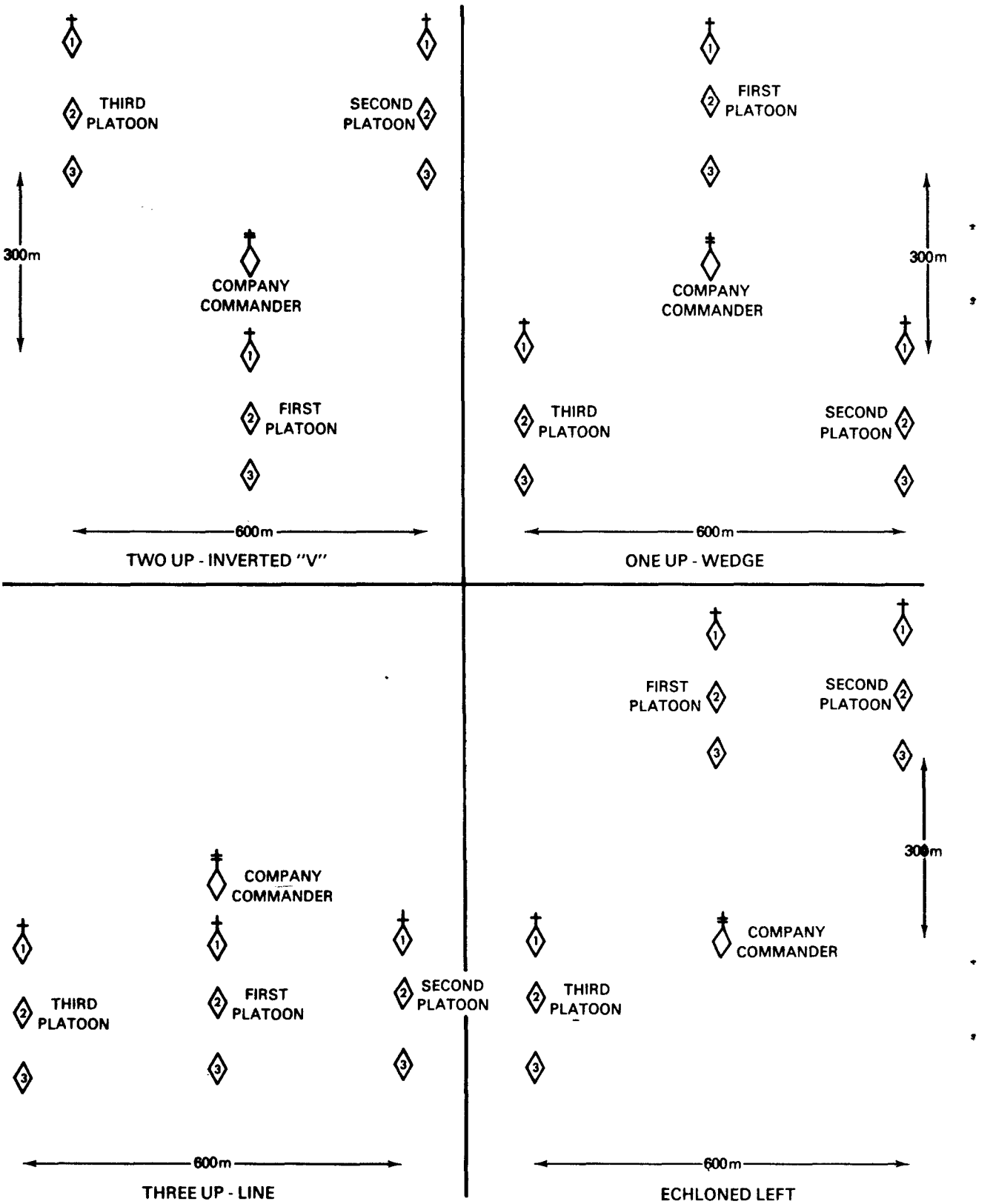


Figure 5. Pre battle Tank Formations.

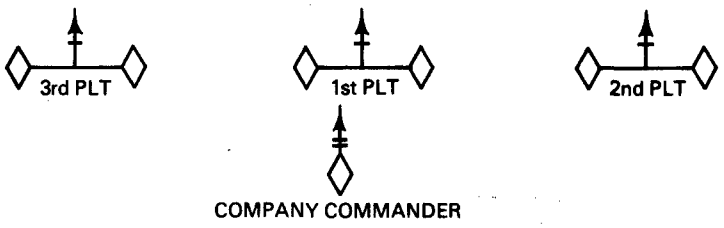


Figure 6. Combat Line.

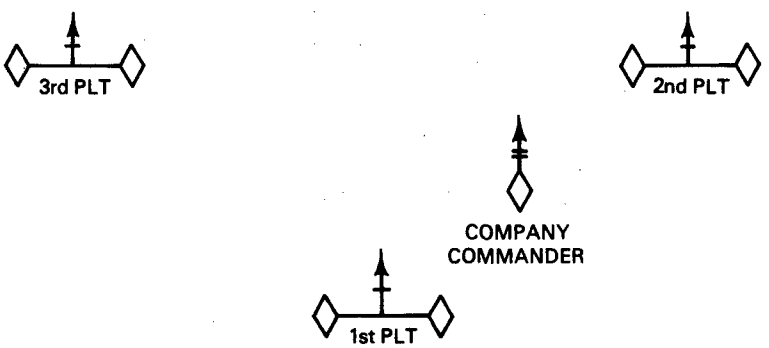


Figure 7. Two Up.

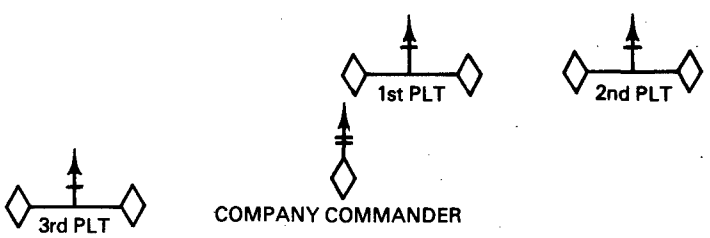
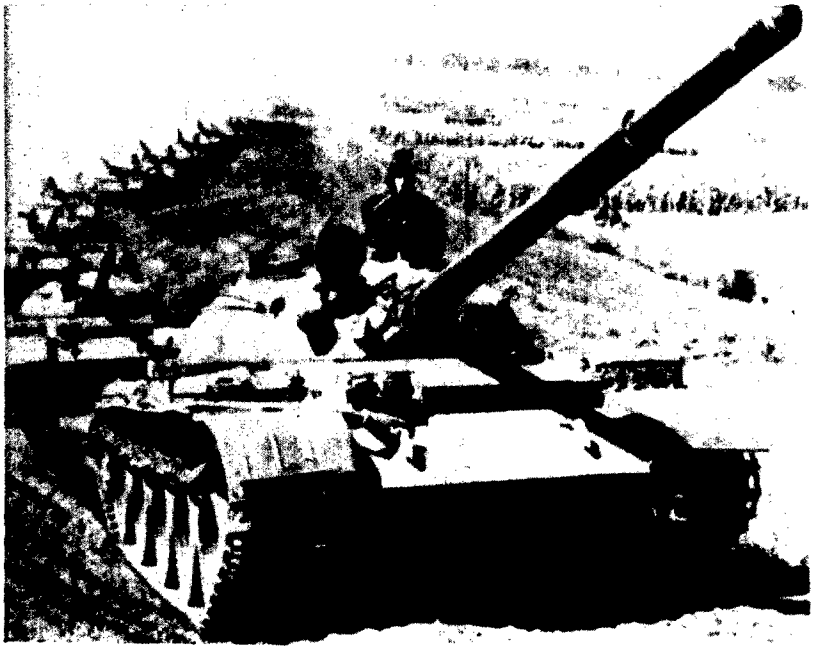
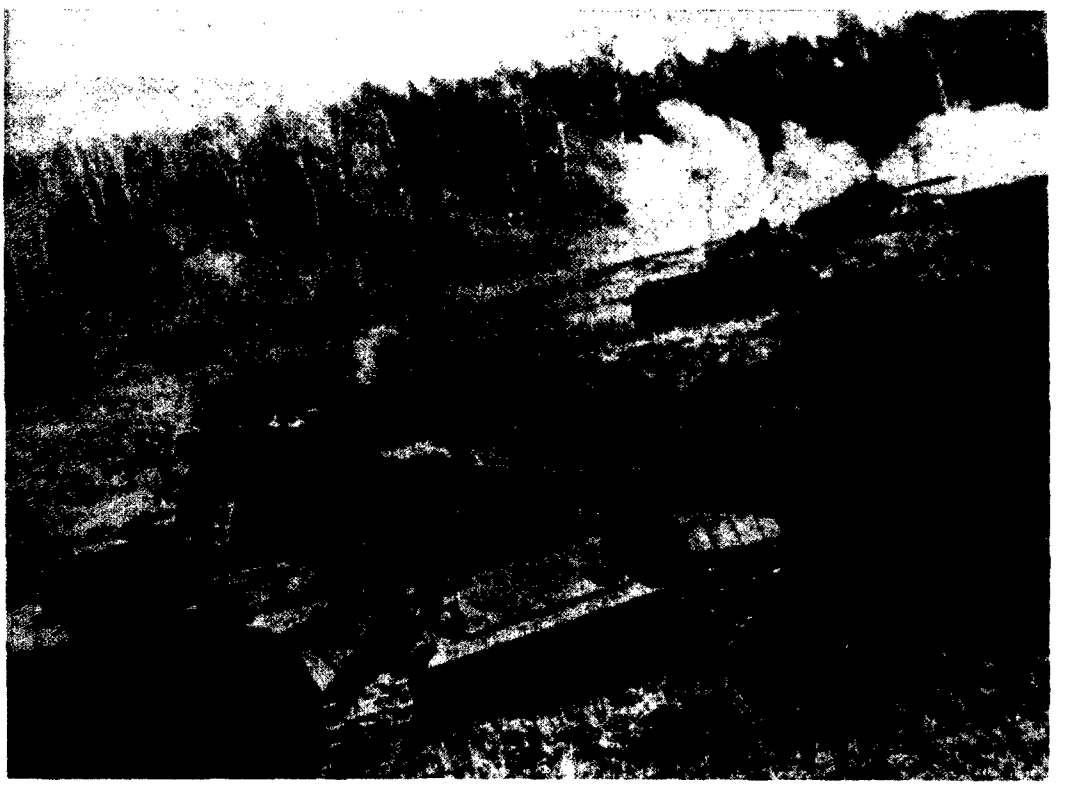


Figure 8. Stepped Right.



T62s in March Formation. Note the 23mm subcalibre sleeve in the barrel of the leading tank.



T62 platoon in combat formation. All hatches are closed once the tanks move from column formation.

CHAPTER 8

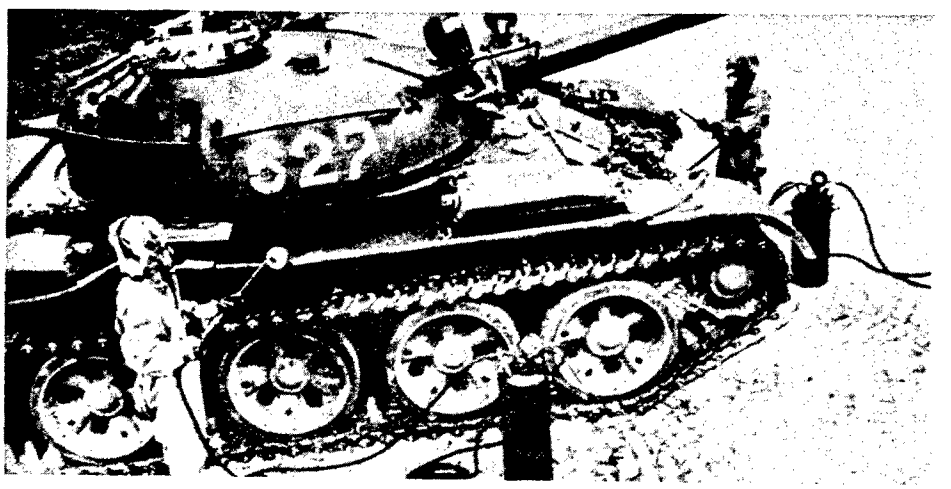
CBR DEFENSE

1. CBR TRAINING. Tank companies train to operate in a nuclear, biological, and chemical environment. During individual and crew training it is stressed that the protective features of the tank are good and that tank units can safely cross contaminated areas. The only CBR monitoring equipment capability within the company is the dosimeter carried by the company commander. When planning operations, the company commander considers the amount of radiation his men have already received and are likely to receive in crossing contaminated areas. CBR reconnaissance teams may be assigned to the company from the regiment for individual operations.

2. PROTECTIVE MEASURES. Each tank crewman has a protective mask and protective clothing. The mask causes severe limitations on visibility and the rubberized protective suit, if worn for prolonged periods, considerably reduces troop effectiveness. Protective clothing is put on during a CBR attack or when the codeword "ATOM" is given over the radio. Audible and pyrotechnic alarms are also used to warn troops of imminent CBR attack. In the T62, there is a device which cuts off the engine upon detection of nuclear radiation.

3. DECONTAMINATION EQUIPMENT. Decontamination routines are employed after a CBR attack. Tank crews brush loose material from their tanks as soon as possible and later drive to a point where the vehicle is pressure washed to complete the process of decontamination.

4. CBR PREPAREDNESS. The Soviet soldier expects to be attacked by nuclear and chemical weapons. CBR training is realistic and is included in major exercises. Soviet soldiers and their commanders are aware of, and train for, a rapid change from nonnuclear to nuclear warfare. Tank company operations are planned accordingly, and often the company is reinforced by specialists from the chemical defense battalion of the division.



Tank crewmen wearing protective suits and masks while decontaminating their tank.

Soviet soldiers are accustomed to training in realistic exercises where CBR attack is simulated.

CHAPTER 9

RECONNAISSANCE

1. COMMAND AND CONTROL. A tank company may be tasked by division, regiment, or battalion to undertake local reconnaissance missions. A medium tank company is more likely to conduct reconnaissance tasks in the offensive than in the defensive. Regimental reconnaissance missions are planned up to 50 kms forward of the main body. At longer ranges these missions are executed by reconnaissance units. Reconnaissance patrols provided by medium tank companies on the flanks of the main body are likely to operate up to 10 kms ahead of the division and within range of artillery support.

2. REINFORCEMENT FOR RECONNAISSANCE. A tank company is normally reinforced for reconnaissance missions. A typical reconnaissance grouping would be:

a. A tank company - 10 tanks

b. A motorized rifle platoon - 3 APC's

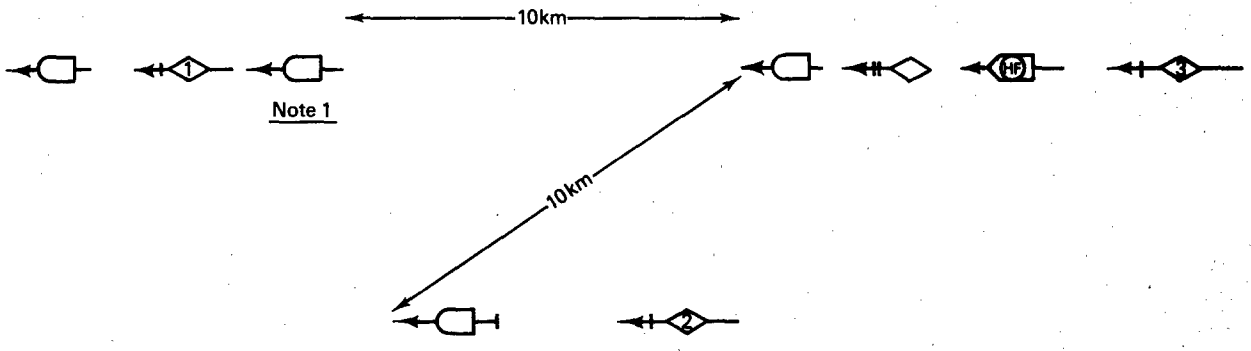
c. An engineer squad - 1 APC

d. A chemical reconnaissance patrol of 3 or 4 chemical specialists - BRDM-2RKH

If the company is acting at long range, a high frequency radio link to battalion will be established. In these circumstances a suitable radio is mounted in a light truck to accompany the patrol.

3. MISSIONS. Reconnaissance missions can be divided into two main types; however, it should be noted these classifications are not Soviet terminology.

a. *Terrain and CBR Monitoring Tasks.* A tank company reinforced by chemical specialists and engineers may be tasked to carry out detailed reconnaissance of roads, bridges, water crossing areas, and obstacles on the division or regimental axis. These reconnaissance tasks can include CBR monitoring of contaminated or suspected areas.



KEY

- Company Commander
- Tank Platoon in Column (Number in Symbol is Platoon)
- APC in Column with Tanks
- Light Truck with High Frequency Radio

Note 1: APC Carrying Engineer Squad

Note 2: Each APC carries one Chemical Specialist

Figure 9. Representative Formation of a Tank Company in Reconnaissance Role.

A four-tank reconnaissance in snow. During reconnaissance, tanks normally move in platoon column before reaching the point where they are likely to encounter the enemy.

b. *Tactical Intelligence Collection.* The tank company is considered by the Soviets to be suitable for reconnaissance missions to gain information on the strength, disposition, organization and movement of enemy forces. Particular reconnaissance targets are:

(1) Nuclear delivery means.

(2) Artillery positions.

(3) Communication centers.

(4) Command Posts.

(5) Reserve Formations.

4. STRENGTHS AND GROUPING. During reconnaissance a tank company usually operates as three patrols, up to 10 kms apart, depending on the mission and terrain. The organization of an intelligence collection patrol is shown in Figure 9.

5. ORDERS. In preparation for the reconnaissance, a tank company commander is given oral orders covering the following:

a. Enemy forces - composition, operations, and known positions.

b. Missions of adjacent reconnaissance units.

c. Attachments to the company.

d. Direction and objective of reconnaissance.

e. Mission.

f. Location and time of crossing the line of departure.

g. Route to be followed.

h. Point of return to friendly lines.

i. Communication method and frequencies.

j. Method of reporting.

k. Casualty evacuation procedure.

l. Vehicle recovery procedure.

m. Method of contact with reconnaissance aircraft.

n. Recognition signals.

o. Procedure for delivering prisoners, captured equipment, and maps.

Tank company commanders are also given a brief outline of the schedule of operations by other friendly forces during his mission. After estimating the situation, the commander issues oral orders to patrol commanders in accordance with the above format. He also designates a second in command - probably the senior platoon commander.

6. MOVEMENT AND OBSERVATION.

a. Movement is made by road at maximum speed in either company column or platoon columns to the point (or points) at which the enemy is likely to be encountered. Reports on terrain and roads are made by radio. Once enemy contact is likely, tanks move by bounds, covering each other; they remain on roads where possible. Populated areas and water obstacles are approached with caution, under cover where possible. If observation reveals no enemy positions, then populated areas are reconnoitered and water obstacles crossed.

b. During the reconnaissance, tank commanders normally will have their hatches open. At night IR devices are used. Listening posts may be set up in platoon strength. These posts are 1.5 kms from the main company patrol. Selected tank crewmen observe for enemy air activity throughout the reconnaissance operation.

7. ACTION ON MEETING ENEMY. The tank company attempts to avoid action during reconnaissance by bypassing enemy positions. Ambushes are planned to capture men and equipment for intelligence purposes.

CHAPTER 10

MARCH SECURITY OPERATIONS

Section A Concepts

1. SMALL SCALE OPERATIONS. The Soviets anticipate that, due to the use of CBR weapons, modern warfare will result in a large number of small scale operations conducted consecutively in different directions and over wide frontages. The majority of these actions will be between forces rapidly advancing toward each other.

2. SECURITY ELEMENTS. The actions of opposing forces' security elements are considered to be of great importance by the Soviets. The need for rapid, decisive action by battalion and company commanders, with strict tactical formations, is stressed in Soviet military writings. Due to the CBR threat and the introduction of sophisticated devices for use during darkness, many meeting engagements are expected to take place at night. While each unit or formation is responsible for its own security, a common task for the tank company is to provide security for a moving column.

Section B Lead March Security Detachment

3. TASK. A reinforced tank company is employed as a forward security element when its battalion is an advance guard. The Soviet term for a company employed in this role is "lead march security detachment (LMSD)." The tasks of a tank company acting as the LMSD are to allow the rapid and unimpeded movement of the main column by:

a. Neutralizing enemy reconnaissance.

b. Protecting the column from surprise attack.

c. Clearing the designated route of light opposition.

d. Acting as a base of fire for offensive action by supporting units in the clearing of heavy opposition.

e. Reporting on terrain and CBR contamination to higher headquarters.

The LMSD normally follow the routes reconnoitered by reconnaissance forces and have the support of the remainder of its parent tank battalion and of attached artillery. The LMSD operates about 5 kms in front of the column it protects.

4. PLANNING. The LMSD tank company commander receives information similar to that received by the reconnaissance company commander (see Chapter 8). In addition he receives full details of friendly reconnaissance missions to his front and flanks, together with information on projected airborne or airlanded operations along his route. The time to pass each control point on the route is specified. An evaluation of enemy forces, terrain, and obstacles to be crossed is then made, and coordination conducted with supporting tactical units. The company commander then gives oral orders to his subordinates for the accomplishment of the mission.

5. STRENGTH AND COMPOSITION. A tank company employed as an LMSD would probably be accompanied by:

a. A battery of 122mm howitzers.

b. A motorized rifle platoon.

c. A combat engineer detachment.

d. Chemical defense specialists.

e. Traffic regulators.

Possibly the following subunits would be added in appropriate circumstances:

(a) An antiaircraft artillery section.

(b) An assault crossing platoon.

Several company tanks are fitted with mine ploughs.

6. METHOD OF OPERATION. The LMSD normally operates in company column and expects to overcome light opposition while remaining in that formation. The LMSD is employed as shown in Figure 10. *Note* that the company commander leads the tank column. The distance between vehicles and subunits is 25 - 50 meters. Individual tanks or APCs are usually detailed to give the LMSD front and flank protection. During the advance, only the company commander makes radio transmissions, giving orders by codewords or code numbers. Control of the column is exercised by flag signals by day and signal flares by night. Air attack is countered by increasing speed and march intervals. Antiaircraft fire is delivered on order of the company commander. During short halts the vehicles close to within 10 meters of each other. At long halts the company deploys into a perimeter defense. LMSD duty rotates within the companies of the battalion.

7. TRAFFIC REGULATION. During tactical moves Soviet combat units rely on directions given by traffic regulators. It is likely that the route to be followed by the main body will be marked by traffic regulators accompanying the LMSD. Traffic control points are probably established by the division traffic control company based on information passed back by the reconnaissance battalion and LMSD.

8. ACTION ON CONTACTING THE ENEMY. The Soviets expect the LMSD to seize the initiative and to surprise and be capable of defeating a numerically superior force. It will normally attack from a flank. Orders issued by LMSD commander by radio on making enemy contact are short and contain the following:

a. Description of artillery targets and time for opening fire.

b. Tank platoon axes, boundaries, and assault positions.

c. Missions and assault lines for supporting infantry subunits.

d. Combat engineer and chemical specialist positions and missions in combat.

e. Order to open fire and the attack signal.

9. ENGAGEMENT.

a. The enemy is engaged directly from the march column. Tank platoons deploy from company column into platoon columns and then into combat line. Motorized infantry generally follows the tanks and remains mounted in APCs during the assault. Hatches are closed when the LMSD moves from precombat into combat formation.

b. If the enemy is in greatly superior strength, the LMSD will act as a base of fire. The LMSD uses its fire power to prevent the enemy from organizing an effective defense while the remainder of the advance guard delivers a flank attack. If the enemy attempts to withdraw, the LMSD will pursue without awaiting further orders.

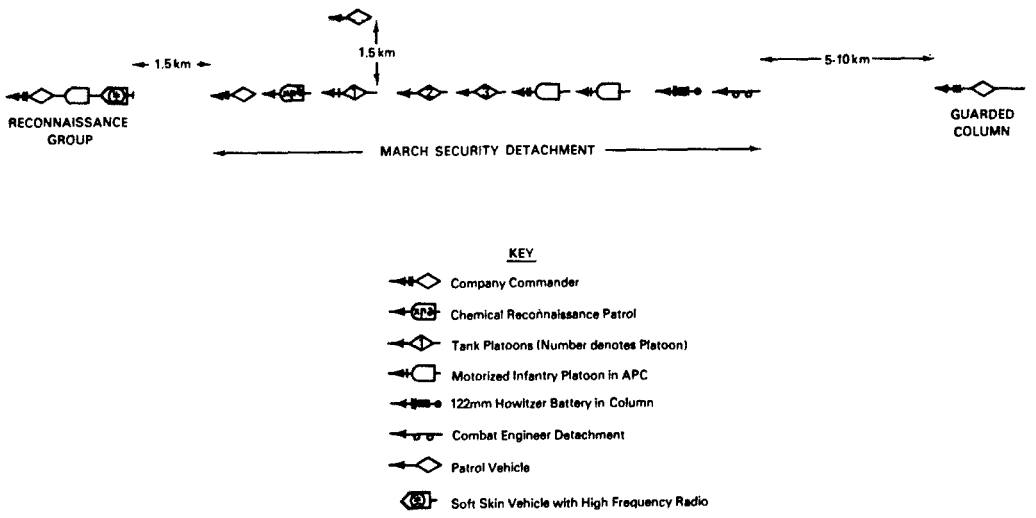


Figure 10. Composition and Deployment of Lead March Security Detachment.

Section C Security of Flanks and Rear

10. LATERAL MARCH SECURITY DETACHMENT. Where there is a threat to a flank of the main body, a reinforced tank company acts as a lateral march security detachment. This detachment operates and is reinforced similarly to an LMSD. It moves on a route parallel to the axis of the main body and about five kilometers from it.

11. REAR MARCH SECURITY DETACHMENT. The Soviet terminology for rear guard is "rear march security detachment (RMSD)." Such a detachment follows the protected column by about five kilometers. A tank company reinforced with combat engineers may be ordered to carry out the actions of a rear guard during withdrawal operations. The aim of the detachment is to prevent penetration of the main column. The RMSD covers the combat engineers as they construct or demolish obstacles. The RMSD may ambush pursuing enemy forces during retrograde operations.

12. SECURITY WITHIN A BATTALION COLUMN. In a battalion column, companies have a primary responsibility for their own security. Company commanders are ready to support the LMSD by means of an enveloping attack from the march column to either flank.

CHAPTER 11

THE OFFENSIVE

Section A Tactical Doctrine

1. CONCEPTS. Soviet doctrine emphasizes that offensive action is the basic combat activity of tank units. The aim in each offensive operation is to concentrate enough firepower to destroy enemy defenses on a narrow frontage and to penetrate his position in depth. Once an offensive gains momentum, Soviet doctrine calls for relentless pressure, day and night, to exploit initial success. This is designed to fragment enemy forces and preclude the enemy's use of tactical nuclear weapons.

2. MISSIONS. A tank company will usually take part in offensive operations as part of a battalion and is supported by other combat arms. A tank company may be given one of two missions. When the enemy's boundaries can be clearly identified the mission is to destroy the enemy within a particular sector or strong point. When enemy boundaries are not clearly defined, the tank company will be ordered to seize and hold key terrain until given a further objective. These missions will take place in the following type of operations:

a. The meeting engagement.

b. The breakthrough.

c. The pursuit.

3. ATTACK FORMATIONS AND FRONTAGES. A tank company normally attacks on a frontage of 800 meters with 100 meters between tanks and 100 meters between subunits when under nuclear conditions. In nonnuclear conditions the company frontage may be reduced to 500 meters with 75 meters between tanks and subunits. A platoon frontage is not greater than 200 meters.

4. FORMS OF ATTACK MANEUVER. A tank company in either the first or second echelon has two basic forms of attack:

a. The frontal attack when the enemy has no assailable flank. Considerable effort is made to neutralize the enemy by means of nuclear, chemical, or conventional fires before a frontal attack.

b. An enveloping attack - either close or deep (see Figure 11). A close envelopment is directed against the flank of an enemy and is supported by the fire of units attacking frontally. A deep envelopment is directed against the flanks or rear of an enemy to a depth beyond the range of direct fire support weapons of the frontally attacking units. An enveloping force is reinforced for independent action and coordinates by radio its tactical operation with units attacking frontally. Close and deep envelopments are usually supported by preplanned artillery fire.

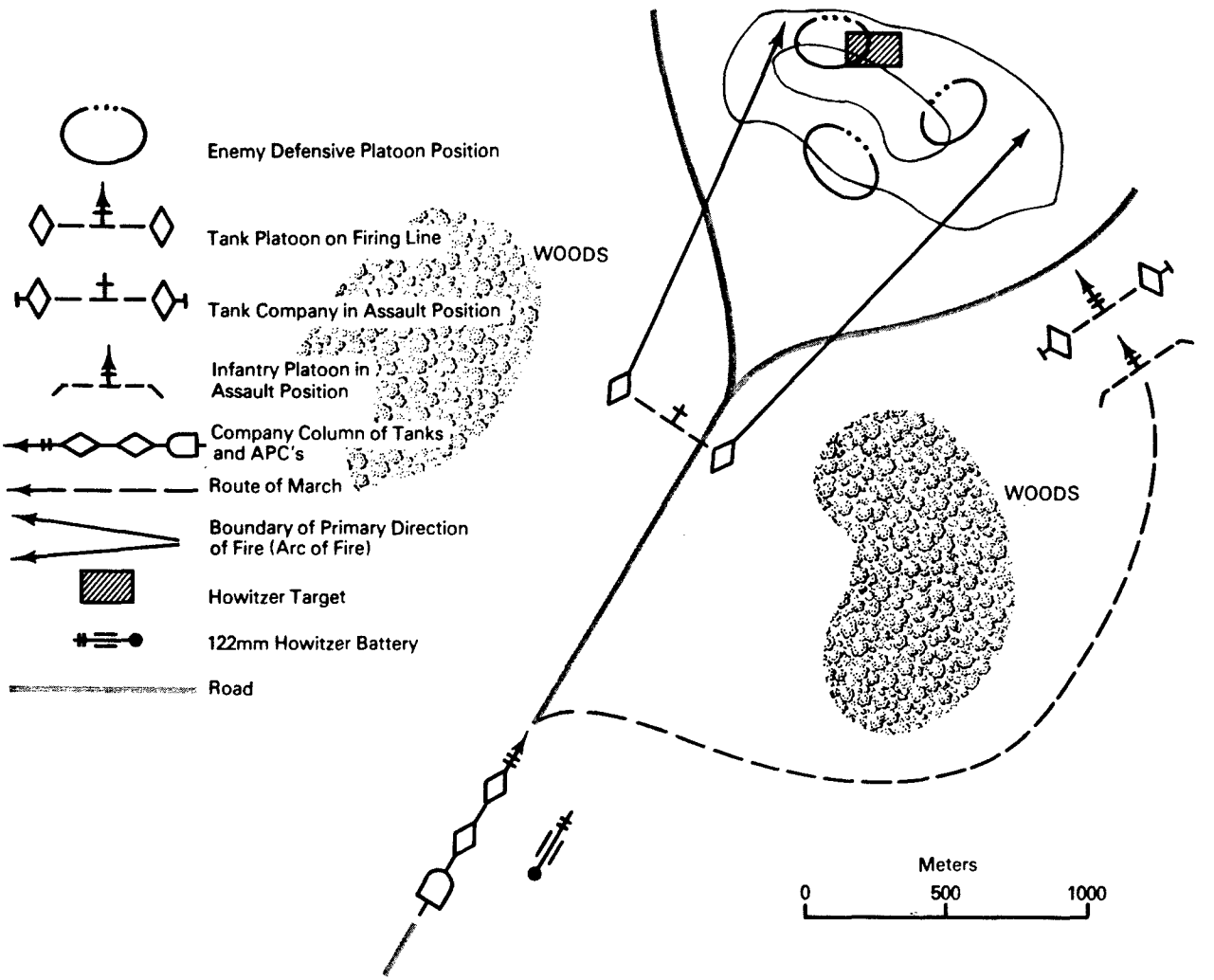


Figure 11. Enveloping Attack by Reinforced Tank Company

Section B The Meeting Engagement

5. CONCEPT.

a. The Soviets define the meeting engagement as combat between opposing columns rapidly advancing towards each other. Meeting engagements are most likely to occur in the following circumstances:

(1) During an advance to contact.

(2) Following a successful breach or breakthrough of enemy defenses.

(3) In the course of an enemy counterattack.

(4) When Soviet forces are counterattacking.

(5) During pursuit.

b. The Soviets consider that success is gained in meeting engagements by the first force to deploy into combat formation and attack with the support of artillery and other weapons. The meeting engagement is a battalion or regimental operation which may be divided into three phases:

(1) Advance of march columns.

(2) Deployment of security elements.

(3) Assault of the main body.

c. This section concentrates on the deployment of the tank company in the assault of the main body.

6. CONDUCT OF THE MEETING ENGAGEMENT.

a. On contact with the enemy, the commander in the LMSD deploys into a combat formation to deliver maximum fire to halt the enemy. He reports to the battalion commander the strength, composition, and location of the enemy force. If possible he attacks the enemy's front or flank. If the enemy has superior firepower the LMSD commander seizes key terrain to act as a base of fire for an attack by the main body.

b. After receiving the LMSD commander's situation report, the battalion commander evaluates the situation. He transmits orders to the main body, which moves into precombat formation. While deploying, the tank company commander can expect to receive information as to:

(1) His mission.

(2) Missions of adjacent units.

(3) Artillery support.

(4) Signals to be used during the assault.

c. The company commander then transmits missions to the platoon commanders while the company moves into combat line. The attack is conducted as a one-phase operation with a single objective. This initial objective is a predesignated line on the ground. The meeting engagement is completed when the enemy is destroyed, is forced into a defensive position, or withdraws. The tank company may then pursue, or temporarily defend, depending on the success of the engagement.

Section C The Breakthrough

7. CONCEPT.

a. The Soviets recognize that a deliberate attack is required:

(1) To defeat enemy forces in prepared defensive positions which cannot be bypassed.

(2) To exploit an initial stalemate in a meeting engagement.

(3) To neutralize antitank weapons, artillery positions, headquarters, and communications facilities.

b. The Soviets consider that success is determined by:

(1) Dispersion to reduce vulnerability to nuclear weapons during preparation for the assault.

(2) Speed in the assault by combined arms teams.

(3) Simultaneous attacks by breakthrough forces on narrow frontages.

(4) Continuous reconnaissance to warn of enemy counterattacks.

8. PREPARATION AND PLANNING.

a. In breakthrough operations a tank company can be reinforced by, or reinforce, motorized rifle units. In either case its tactics would be the same.

b. Before the attack, the company commander receives oral orders from the battalion commander and makes an estimate of the situation. He conducts a reconnaissance with his platoon leaders and commanders of attached and supporting units. Upon completing his reconnaissance, the company commander issues oral orders which include:

(1) Disposition and composition enemy forces.

(2) The missions of the company and its attached and supporting units.

(3) Information on adjacent units and their missions.

(4) The direction of advance.

(5) Combat formations.

(6) Lines of departure/deployment and assault positions.

(7) The coordination of radio communications.

(8) Codewords.

(9) Arrangements for artillery support.

(10) Vehicle recovery and repair.

(11) Casualty evacuation.

(12) Location of the second in command.

c. Platoon commanders reconnoitre the ground with tank commanders if there is time.

9. COORDINATION OF FIRE SUPPORT.

a. A tank company commander orients his subordinates on artillery support. Reference points are designated and assigned codewords. These reference points are used to call for and adjust supporting fire. It is significant that the company commander and not an artillery forward observer calls for supporting artillery fire through the battalion commander. Platoon commanders can request fire support from the company commander, but individual tank commanders may not do so.

b. It is apparent that at present Soviet company commanders do not always understand and properly use the techniques of fire support coordination. In their orders to subordinates they merely repeat the company's mission without explaining and tying in the means by which fire support is provided. Artillery fire support is often pre-planned, may be unobserved, and is usually fired on a schedule.

10. CONDUCT OF OPERATIONS.

a. There are two methods of launching a breakthrough:

(1) From the march against an ill prepared enemy.

(2) By deliberate assault against prepared defenses from a holding area.

b. Breakthrough operations from the march are dynamic, spontaneous, and unpredictable. Therefore, only operations launched from a holding area are examined.

11. ACTION IN THE HOLDING AREA. A tank company commander prepares his company for combat while regimental orders are being issued to the battalion commander. Tanks are refueled, serviced, and resupplied with ammunition. After receipt of the battalion commander's orders, reconnaissance is conducted and orders given to platoon commanders. Time permitting, rehearsals are carried out. Movement from the holding area is shown in Figure 12.

12. ADVANCE TO ASSAULT POSITION. A tank company moves forward, on order, with its attachments.

a. The move from the holding area is timed so that the line of departure is reached at the time specified in the battalion order. If the attack is to be preceded by a nuclear strike against forward enemy positions, arrangements are made to protect the attacking force from the strike. Areas affording protection from radiation are preselected along the route and are occupied only as long as necessary to shield the tanks and attached units from radiation.

b. The company deploys into precombat formation approximately two kilometers from the line of contact. Platoons deploy into combat formation approximately 500 meters before reaching the line of contact (see Figure 12).

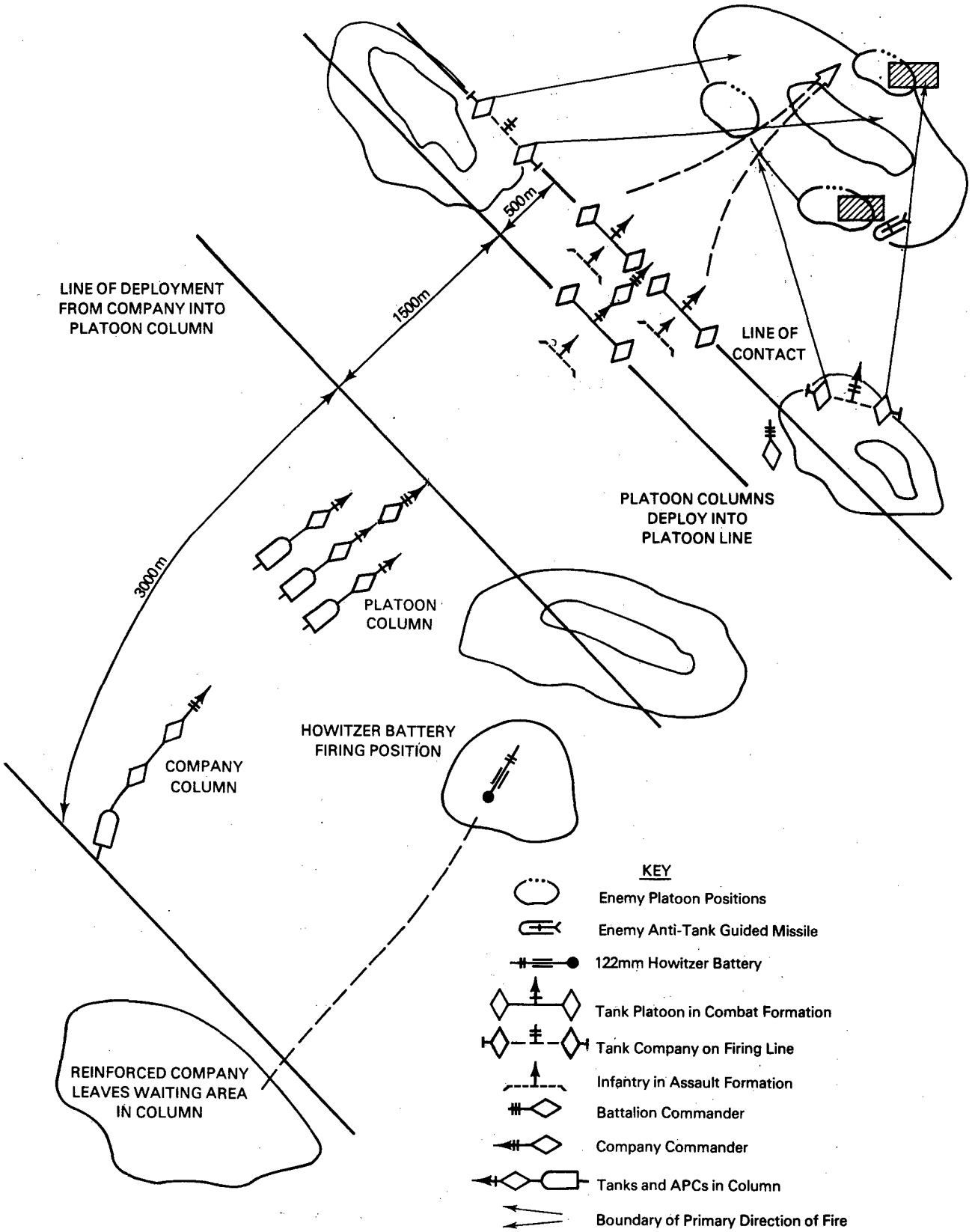


Figure 12. Advance from a Holding Area.

13. ASSAULT. The tank company, when leading the assault, moves at high speed, firing on enemy weapons and personnel in the forward edge of the battle area (FEBA). When required, engineers prepare passages through antitank obstacles forward of the defenses and company tanks equipped with mine ploughs make hasty gaps in minefields. If there are no gaps in the minefields and mine ploughs are not available, the company advances through the minefield in precombat formation.

a. Under cover of supporting fires, tanks and attached motorized rifle units attempt to penetrate the defenses, and then continue the advance. A tank company supports adjacent units but does not deviate from its own direction of advance. Momentum is maintained even when supporting elements are slowed or halted.

b. In the attack, tanks fire on the move, from short halts, or at the halt. The preferred method is to fire on the move, which provides immediate firepower without slowing the tempo of the advance. The short halt is used to fire one aimed round from the main gun or several bursts from the machinegun. A longer halt is used to fire three to four rounds. When tanks encounter a target of importance to the mission, concentrated fire of the company is used. Tanks halt behind available cover and continue to fire until the target is neutralized.

c. Attached motorized rifle units normally follow the tanks by 100 to 500 meters. Motorized rifle troops remain mounted whenever possible and try to maintain the same speed as the tanks, firing through the ports of the APCs during the assault. (see Figure 13)

d. After overcoming the forward positions of the enemy defense, tank units become the spearhead of the advance and are given priority of artillery support. Enemy strong points are bypassed. If the advance of a company is halted and a flanking maneuver is not possible, the company commander calls for additional fire support. Tanks then move under cover of supporting fire in their assigned direction as far forward as possible. Radiological or chemical contaminated areas do not slow the tempo of the advance; these areas are crossed rapidly or bypassed.

14. EXPLOITATION. After overrunning an enemy defensive position, a tank company commander orders his tanks to continue the attack. If resistance collapses completely, the company forms into march formation and continues in pursuit of the withdrawing enemy.

15. BREAKTHROUGH OF A HASTY DEFENSE. A hasty defensive position is characterized by lack of engineer fortifications, inadequate fire planning, and significant gaps within the defensive positions. The Soviets consider the enemy in a hasty defense, will attempt to strengthen his position along key terrain.

a. The basis for success in overrunning a hasty defense is to attack from the march without lengthy preparation. Penetration is supported by available artillery fire and air strikes. The rapid momentum and shock created by aggressive use of tanks is intended to disrupt enemy withdrawal, and to force piecemeal commitment of reserves. A sudden attack seizes the initiative, while continuous pressure forces the enemy to fight without coordination.

b. A tank company approaches the enemy defensive position in march or combat formation. During the approach, the company commander receives orders by radio from the battalion commander. These orders specify the line of deployment, the objective within the FEBA and the direction of further advance. The company commander evaluates the situation, and transmits orders to the platoons. When supported by motorized rifle units, the company commander defines their missions and assault positions. The assault is then carried out in same manner as that described in paragraph 13 (see Figure 14).

16. TANK PLATOON AS BATTALION RESERVE. A tank platoon can be used as a battalion reserve during offensive operations. Its tasks are exploitation, mopping up bypassed pockets of resistance, or the support of motorized rifle units as an immediate antitank defense. During the offensive, the reserve platoon will follow the battalion commander one tactical bound behind the combat formation. The battalion commander transmits missions to the reserve platoon, which usually moves through a gap in the battalion line or from the flanks.

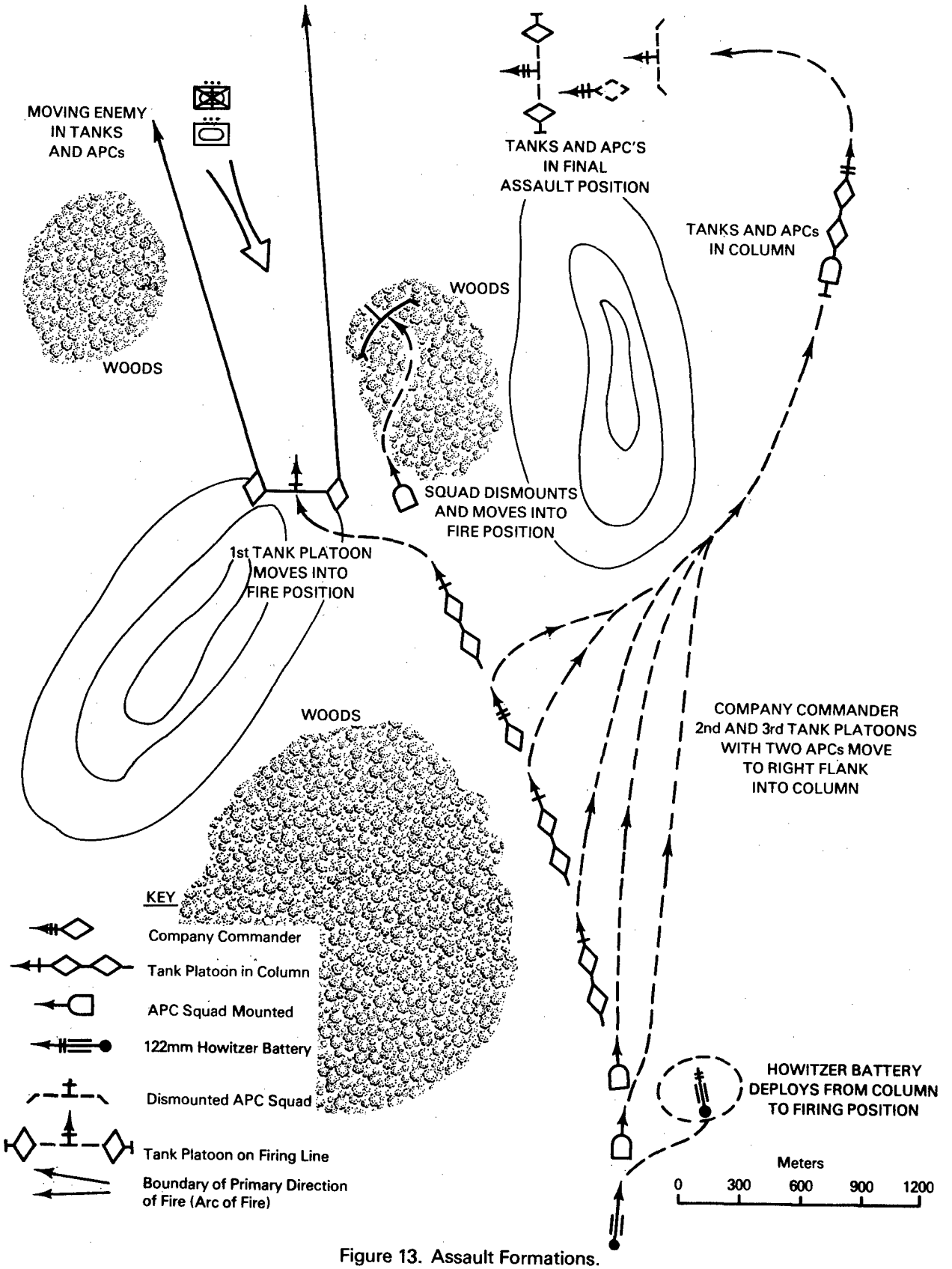
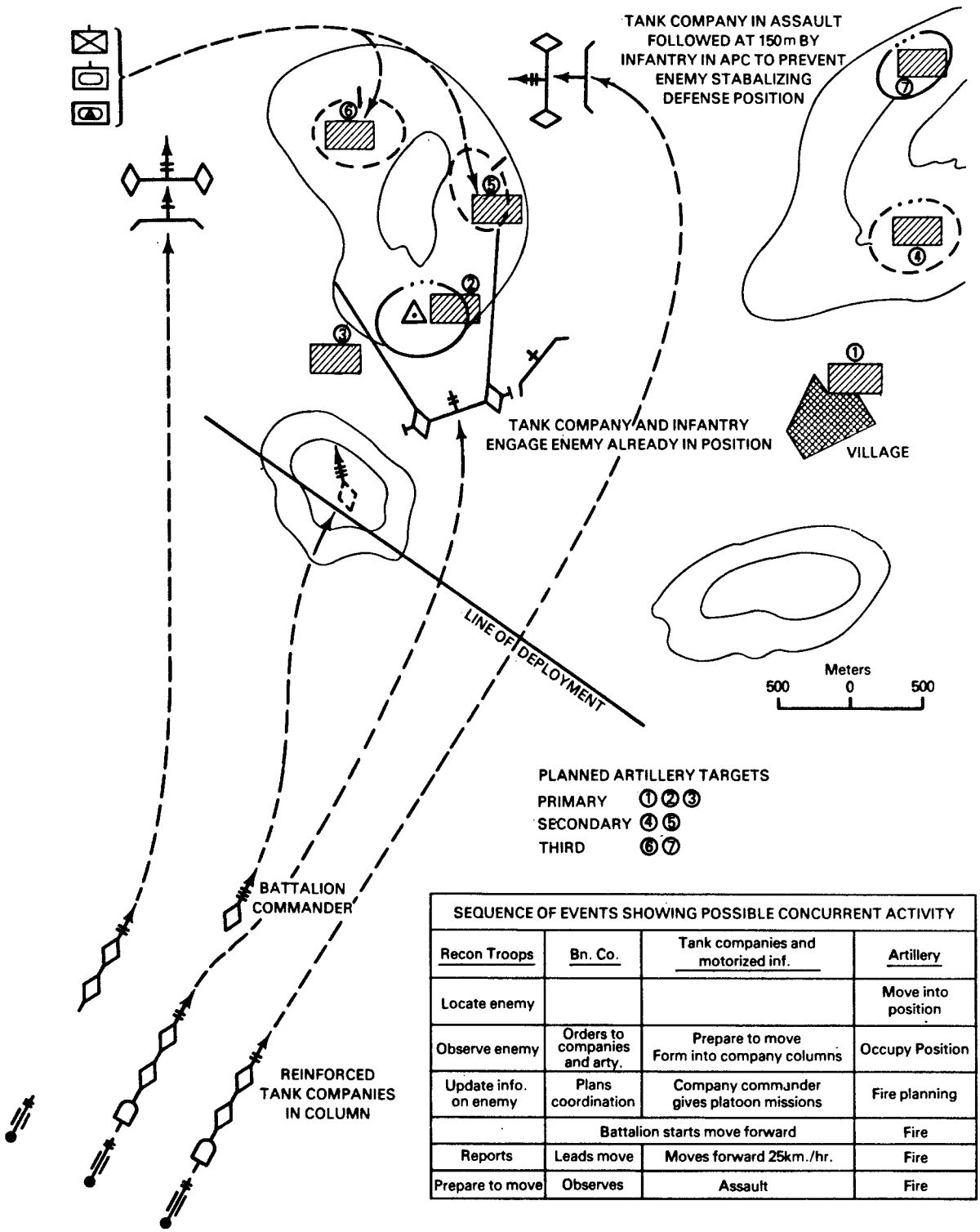


Figure 13. Assault Formations.



SEQUENCE OF EVENTS SHOWING POSSIBLE CONCURRENT ACTIVITY			
Recon Troops	Bn. Co.	Tank companies and motorized inf.	Artillery
Locate enemy			Move into position
Observe enemy	Orders to companies and arty.	Prepare to move Form into company columns	Occupy Position
Update info. on enemy	Plans coordination	Company commander gives platoon missions	Fire planning
	Battalion starts move forward		Fire
Reports	Leads move	Moves forward 25km./hr.	Fire
Prepare to move	Observes	Assault	Fire

Figure 14. Breakthrough of the Hasty Defensive Position.

Section D Pursuit

17. CONCEPTS. Pursuit is the continuation of the advance against a disorganized, withdrawing enemy. A tank company with its mobility and firepower is ideally suited for pursuit. Company commanders are required to initiate pursuit immediately upon indication of enemy withdrawal; they then inform the battalion commander. The Soviet aim is to turn a limited enemy withdrawal into a full scale retreat through pursuit by units in contact. Pursuit is continued day and night and is terminated only on orders of the higher commander or because of strong enemy resistance. Reinforcement and employment of a tank company in pursuit will be similar to that in a meeting engagement.

18. CONDUCT OF THE PURSUIT. A reinforced tank company participates in pursuit as part of a larger force. The pursuit may be direct, parallel, or a combination of both, in which case it will be a regimental operation.

a. Direct pursuit is the continued frontal pressure applied against a withdrawing enemy to deny him time to reestablish a defensive position.

b. Parallel pursuit is rapid movement along axes parallel to the enemy withdrawal route, with the intent to attack his flanks or rear.

c. A combined pursuit is the application of both direct and parallel pursuit against a withdrawing enemy (see Figure 15).

19. MISSIONS OF THE TANK COMPANY IN PURSUIT. Probable missions for a tank company engaged as part of a larger force in pursuit operations are:

a. Reconnaissance.

b. March security detachments.

c. Tank ambush parties.

d. Seizing key terrain on withdrawal routes.

A tank company pursues in march or precombat formation and moves into combat formations on enemy contact.

20. LOGISTIC SUPPORT. Pursuit operations require considerable logistic support both in ammunition and POL. Higher headquarters must keep supplies well forward and readily available to the pursuit forces.

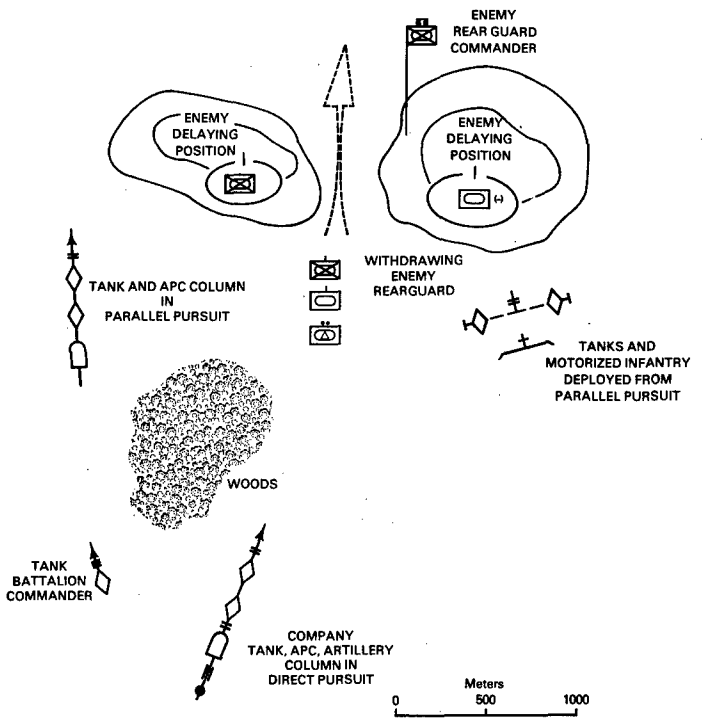


Figure 15. Direct and Parallel Pursuit.

Section E Night Attacks

21. CONCEPTS. The Soviets consider night attack as a normal operation to maintain momentum. Night attacks gain surprise, reduce casualties, and minimize the threat of nuclear attack. With improved night vision and battlefield illumination devices, the Soviets place the same reliance on tanks that they do during the day. Tank units are accompanied by motorized rifle and artillery units for night offensives. The majority of night attacks are deliberate, but targets of opportunity will be exploited by a hasty attack should the opportunity occur.

22. PLANNING. A tank battalion commander plans night attacks and briefs and conducts reconnaissance with his company commanders during daylight if possible. If time permits, a terrain reconnaissance is conducted during darkness so that the difficulties of control, coordination, and illumination can be resolved. Preparation and planning for a night attack is extensive if it is launched against a prepared position. It will include:

a. Establishing easily recognized reference points.

b. Marking the axis of advance.

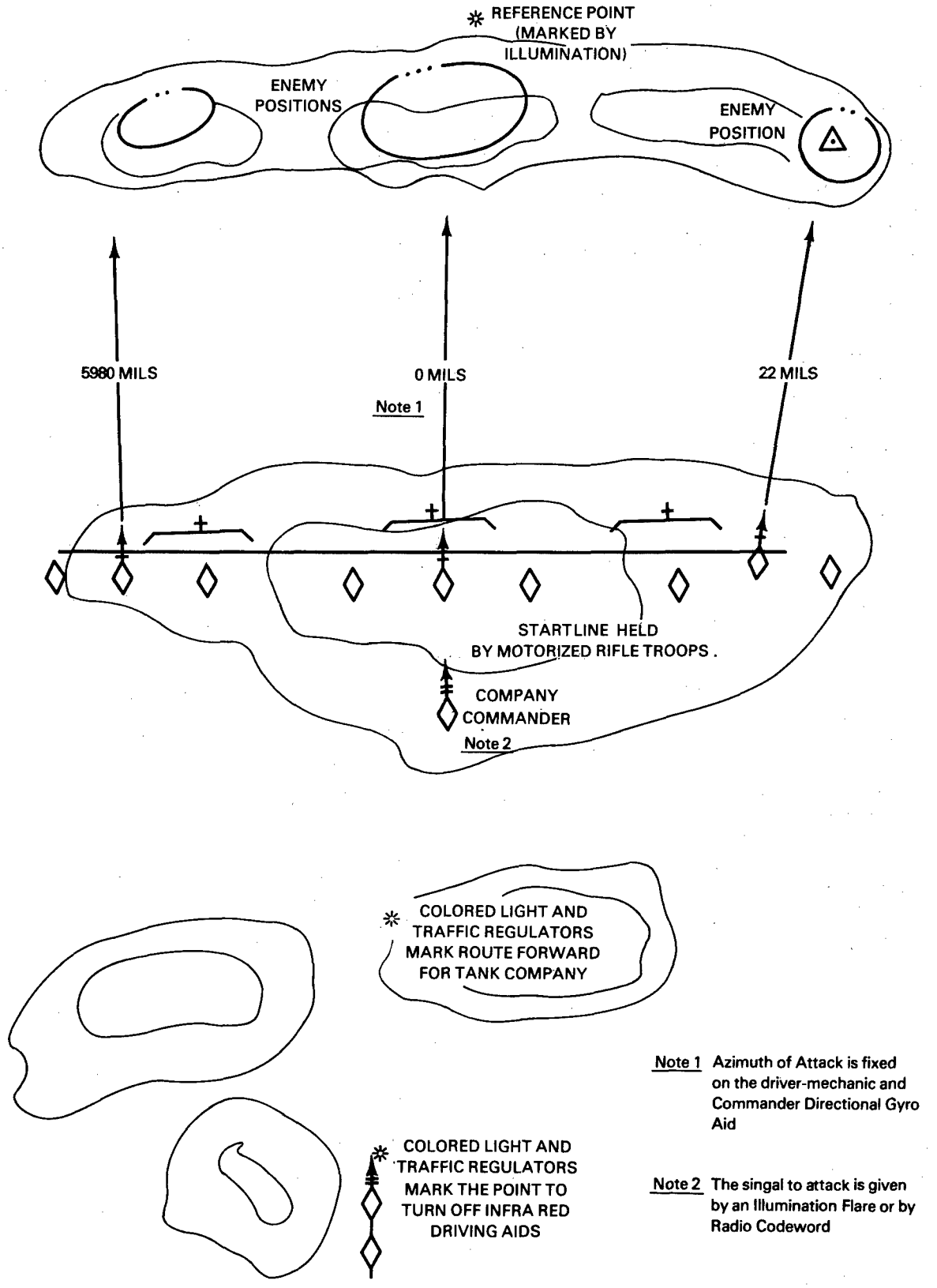
c. Issuing the azimuth for the direction of the attack.

d. Coordinating the use of night vision devices and battlefield illumination means.

Coordination of company boundaries and use of artillery fire is given great emphasis. A careful check of tanks is made to ensure that unauthorized vehicle lights are extinguished (see Figure 16).

23. ADVANCE TO ASSAULT POSITION. Covered routes to the assault positions are used, if possible, to counter the effects of enemy night vision and detection equipment. If there are no covered routes, tanks move to their line of deployment in march formation under cover of artillery. A supported night attack is preceded by a short intense artillery preparation. Artillery fire is planned to neutralize the enemy and to destroy means of night surveillance. If there is an illumination plan, this is implemented after the artillery preparation is complete.

24. CONDUCT OF THE ASSAULT. On order, the tank companies lead the assault in combat formation. They open fire using night vision devices or the daylight sight while on the move. Minefields and other obstacles are negotiated through previously marked lanes. Tanks are followed by motorized rifle units in APCs. Emphasis is on destroying enemy pockets of resistance without maneuvering at the start of the attack. Tank units attempt to advance directly along predesignated routes using directional gyro compasses (see Enclosure 3). Reference points and azimuths are used to reorient tanks which deviate from their routes. If the tank company encounters a superior enemy force, temporary positions are selected to provide good fields of fire, antitank defense, and cover from nuclear strikes. Enemy counterattacks are repulsed by concentrated tank and artillery fire. Repulse of an enemy counterattack is followed immediately by an attack on a flank to regain the initiative. The tempo of the advance continues throughout the following day and night. At first light the company commander reevaluates the situation and issues new orders, paying particular attention to likely enemy counterattack routes. If the situation permits, fuel and ammunition are called forward and damaged tanks and casualties evacuated by the battalion repair and evacuation group (REG).



Note 1 Azimuth of Attack is fixed on the driver-mechanic and Commander Directional Gyro Aid

Note 2 The singal to attack is given by an Illumination Flare or by Radio Codeword

Figure 16. Control Measures for Night Attack.

25. MOUNTAIN AREAS. The Soviets regard the limiting factors of terrain and engine performance to be restrictive but not insurmountable to armor operations in mountain areas. The tank company requires 30 to 50 percent more fuel for mountain operations. Pioneer tools are required for each tank. The value of supporting motorized rifle units and attached artillery and mortars is high in mountain operations. Company tactics are designed to exploit firepower. Combat formations employ the maximum possible number of tanks forward. Extensive reconnaissance is required to avoid enemy tank ambushes. The tank company commander attempts to move on roads, using lateral and parallel roads to maneuver to the flanks of enemy positions. March and precombat formation intervals are doubled during mountain operations.

26. FORESTS AND MARSHLANDS. In forests and marshlands movement is restricted to roads, fire breaks, and through sparse woods and clearings. Tank companies normally operate in conjunction with infantry. Movement is restricted to columns, but echeloned movement on parallel routes and some flank maneuver may be attempted. Contact between units is maintained by dismounted infantry. The Soviets see the problem of operations in forests and marshes as being terrain, restrictions on tank gun range, control, observation, and orientation. Rates of advance are greatly reduced. The destruction caused by nuclear strikes in forest or marshland dictates that engineer support be attached to tank companies for operations. In summer the provision of repellent to ward off "winged blood sucking insects" is thought to be essential.

27. OPERATIONS IN SNOW. During operations in snow, the problems of overcoming terrain and low temperatures are given more emphasis than tactics. Operations in such areas are considered by the Soviets to be dependent on the effectiveness of logistic support. In particular, clothing, anti-frostbite equipment, and vitamin preparations are considered to be indispensable. Movement is restricted and attacks are launched from column as near to enemy positions as possible.

T62's operating in march formation in snow covered mountain area.

CHAPTER 12

RIVER CROSSING OPERATIONS

1. CONCEPTS. Soviet tactical doctrine stresses the importance of crossing rivers, gaps, and water obstacles without losing momentum. Bridging, ferrying, and amphibious equipment is designed to cross water obstacles as rapidly as possible. When crossing water obstacles, a medium tank company operates as part of a battalion. The company may cross the obstacle in one of the following ways:

a. Over permanent or temporary bridges.

b. Over tank launched bridge sections.

c. Over truck launched pontoon bridges.

d. Over amphibious bridge sections or ferries.

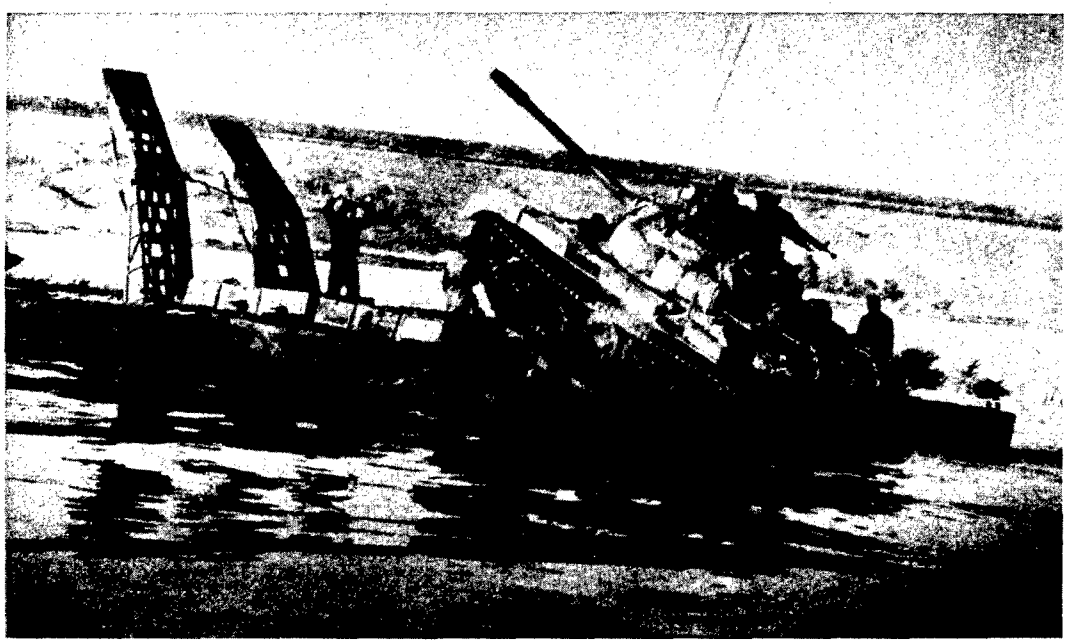
e. Tracked self propelled ferries.

2. PLANNING AND CONTROL.

a. The Soviets cross water obstacles from the line of march. This presupposes that reconnaissance and security operations have been carried out and that engineer preparations have been completed or tanks have been prepared for snorkeling.

b. The battalion commander normally receives radio orders which designate the crossing area. The battalion headquarters controls the crossing as shown in Figure 17. A regulation station is established near the crossing sites. Each fording site is controlled by a crossing commander who will normally be from the attached engineer unit. A command post is set up on both banks to control forward companies crossing the obstacle. This will be under direction of the battalion deputy commander for technical matters. Routes to crossing sites will be marked. The repair and recovery group, battalion aid station, and rear service elements cross after the tank companies.

3. FORDING. A site 30 to 50 meters wide is used for a company crossing water obstacles by deep fording. In this mode the tank requires no preparation. However, the banks of the obstacle may need preparation where vehicles enter and exit the water. A tank may pass through a depth of 1.4 meters without a snorkel. Markers indicate the site, and at night green lights are used to indicate direction.



T54/55 being loaded onto a ferry before crossing a water obstacle. All but first echelon units will normally cross water obstacles by bridge or ferry.

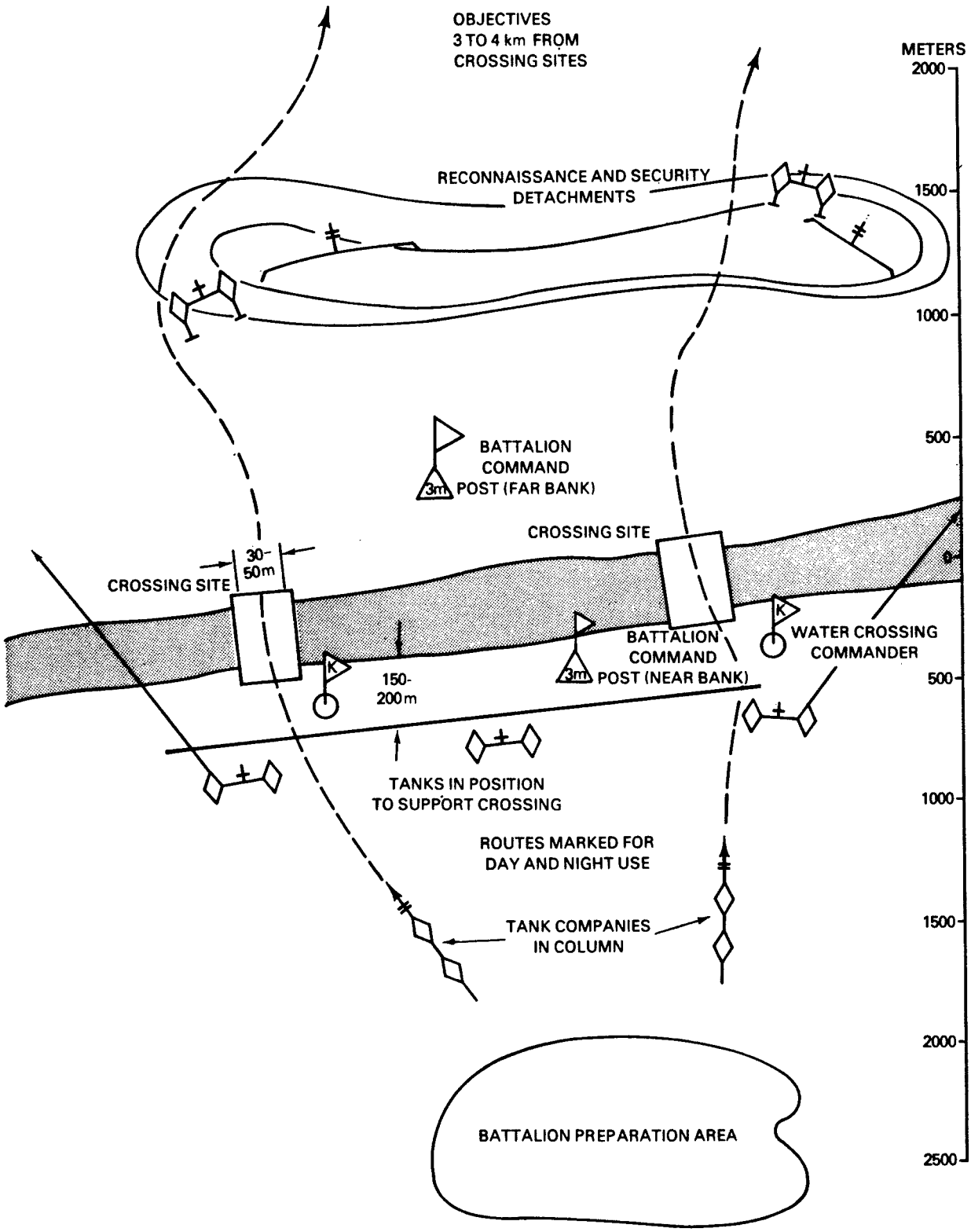


Figure 17. River Crossing Control Organization.

4. SNORKELING.

a. Soviet tanks equipped with snorkels can cross under a water obstacle up to 5.5 meters in depth. Preparation of the entrance and exit points of the obstacle may be required. Tanks require preparation and tank crews undergo training to learn snorkeling techniques.

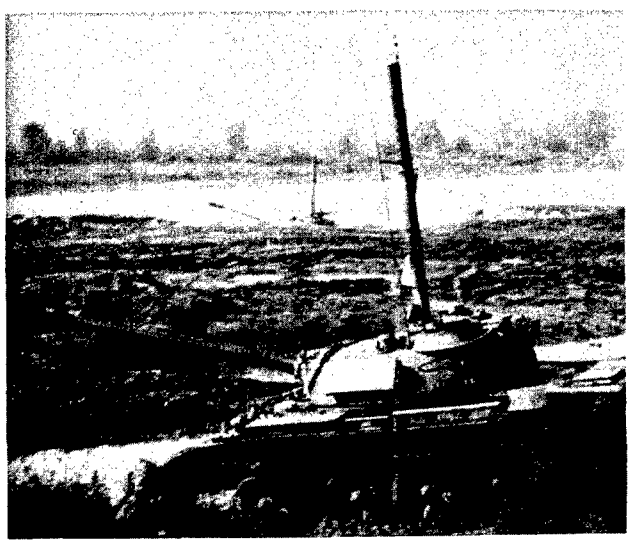
b. Times to prepare a medium tank unit for a snorkel crossing of a water barrier vary greatly with the type of tank involved but normally it is about 1 1/2 hours. The turret is sealed with an inflatable rubber device. Special one way valves are attached to the exhaust system to allow the exhaust fumes to escape but prevent water from entering. The remaining exposed working parts are smeared with resin and snorkels are then attached. Special wide "chimney snorkels" are used in training only. These are wide enough for a man to escape through. In combat a narrow tube is used for ventilation. Tanks are driven cross the obstacle on a preassigned magnetic azimuth, with necessary corrections to left or right given by radio from tanks on the banks. In combat, after leaving the water the snorkel is jettisoned. The tank then requires about 20 minutes work before it can operate normally. A snorkeling tank must be driven slowly in low gear as the tracks tend to slip. Care must also be taken, or it will stall and have to be pulled out of the water. Tank crews use gas mask equipment while snorkeling as a source of oxygen. Snorkeling tanks are vulnerable to underwater obstacles, soft river beds, swiftly flowing currents, and debris. Whenever possible the Soviets cross water obstacles by ferry or bridges.

5. STAGES IN CROSSING WATER OBSTACLES. A tank company may be called to cross a water obstacle in either reconnaissance or march security roles, or as part of the main body. The method of crossing a water obstacle is determined by the mission of the tank company in the advancing column.

a. *Reconnaissance.* Tank companies in the reconnaissance role are reinforced by engineers, divers, and chemical specialists to survey river banks to find suitable crossing sites. Motorized infantry and artillery are in support. If underwater survey is required, it will probably be conducted at night. Reconnaissance elements also seek to identify existing bridges or fording sites as well as enemy positions on both banks.

b. *Security Detachments.* Tank companies employed as security detachments seize crossing areas discovered by reconnaissance elements and attempt to use shallow fords to establish a bridgehead on the far bank. The near banks of crossing sites are held until the arrival of the main body if the enemy strength prevents an immediate crossing.

c. *Main Body.* A company in the main body crosses the obstacle using either fords or established crossing sites under the cover of security detachments. After crossing the obstacle, it moves on designated routes to its objective, perhaps three to four kilometers from the obstacle. If the battalion has no security elements, a company will cross as a LMSD after intensive concentrations of artillery and tank fire.



T54/55 fitted with the narrow snorkel tube used in combat operations. Note the cover on the gun muzzle.

CHAPTER 13

DEFENSE

Section A Concepts

1. SUCCESS OF DEFENSE.

a. The Soviets regard the defensive as a temporary phase designed to repel the attack of superior enemy forces while inflicting significant losses. The purpose is to hold positions long enough to create conditions favorable for a return to the offensive. In tactical terms the success of defense depends on the skillful use of terrain, combined with a well coordinated fire plan.

b. Switching to the defense can take place either in or out of contact with the enemy. A defense adopted while in contact with the enemy is considered to be a difficult operation. It is likely that the tank company will be expected to seize a linear position on tactically significant terrain. This initial position should be capable of being converted into a stronger position when circumstances allow. Out of contact, a position in depth will be planned when ordered.

Section B Organization of Defense

2. TANK COMPANY TASKS. A tank company is used in defense in one of the following roles:

a. Holding an area.

b. A counterpenetration or counterattack force.

c. Reinforcing the antitank defense of a motorized rifle unit, normally a battalion.

d. As a force to cover an area between CBR contaminated areas.

e. A tank ambush.

A tank platoon may be used as a battalion reserve or as a reconnaissance patrol.

3. FRONTAGES. When employed in the defensive role, as part of a battalion, the tank company defends a strong point approximately 1000 meters wide and 500 meters in depth. There are normally 300 meters between platoons. The arc of observation for an individual tank is restricted to the field of vision as seen through the gunner's and commander's sights without moving the turret. This gives an arc of 300 Soviet mils.* Tanks are normally assigned an individual arc of fire between 200-250 Soviet mils. There are normally 150 meters between individual tanks. Figure 18 gives further details of the arc of fire.

4. DEFENSIVE CONFIGURATION. A tank company commander considers the following in selecting defensive positions:

a. Maintaining tank fire density while retaining all-round defense.

b. Reverse slope positions.

c. Mutual support within company and with adjacent units.

d. Secondary fire positions for tanks with covered routes from primary positions.

Given these conflicting requirements, the tank company commander usually places his platoons two forward and one back. The rear platoon can be to the center, right or left rear as dictated by the terrain and threat. Motorized rifle troops give local protection to tanks and fill in gaps within the position, using machineguns and hand-held antitank weapons. Linear formations are acceptable in positions where the tank company is in the second echelon. Within the defensive position a "wandering tank" may be designated to move between gaps and flanks to confuse the enemy's estimating the number and locations of the tanks.

5. TANK FIRE FROM PREPARED POSITIONS. A tank company firing from prepared positions is

*There are 6000 unit mils to a circle in the Soviet system.

expected to open fire at 1500 meters and achieve a 50 percent kill ratio. The Soviets consider that enemy tanks will attack at an average of 15 km/hour. They estimate that each Soviet tank in the company will be able to fire 10 to 12 rounds during an enemy attack. Each Soviet tank is therefore credited with a potential of five or six tank kills. It is projected by the Soviets that a tank company, after 30 percent casualties, can still theoretically counter an attack by 30 to 40 enemy tanks. Although such mathematics are optimistic, they are typical of the Soviet attitude to tactical questions.

6. ENGINEER PREPARED DEFENSIVE POSITIONS. When a company is out of contact with the enemy, considerable engineer work can be accomplished in preparing tank positions. The priority of work is usually as follows:

a. Positions for tanks and APCs.

b. Clearing arcs of fire.

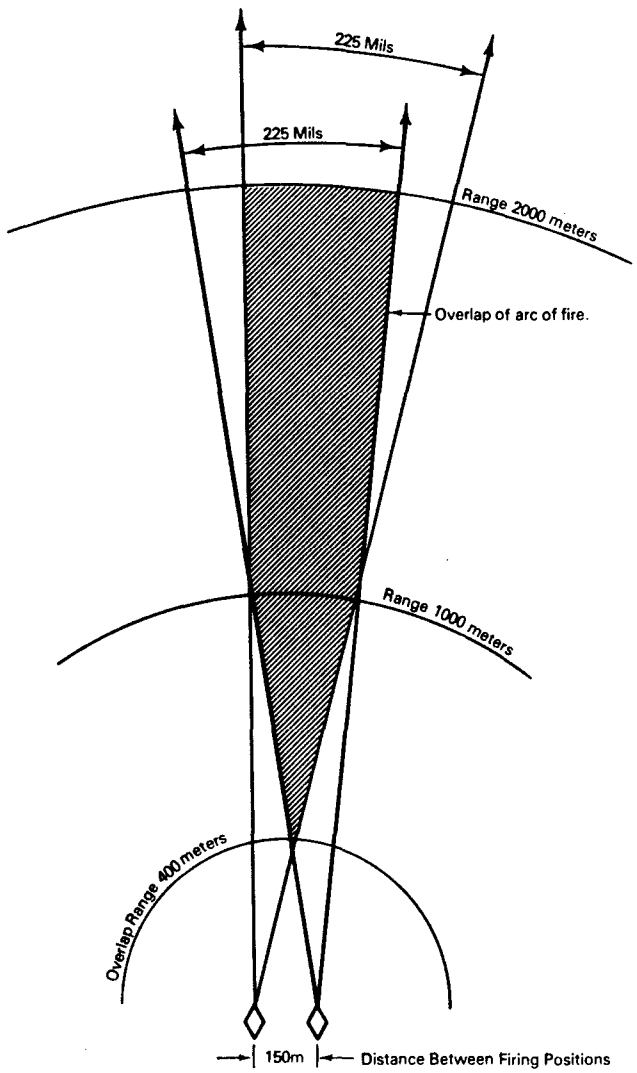
c. Constructing antitank and antipersonnel obstacles along likely enemy avenues of approach.

d. Preparation of alternate positions.

e. Preparing ammunition storage facilities.

A typical tank firing position is shown in Figure 19.

7. FIRE PLAN. Those areas which cannot be covered by direct fire are covered by artillery and mortar fire. The flanks and the forward edge of likely enemy assault positions are priority artillery targets.



Arcs of Fire

1. Figure shows the interlocking arcs of fire of two tanks in the Primary Arc of Fire. The criteria are that fire of individual tanks interlocks at 400m., and that at least ¼ of the front of the arc is overlapped. The 200-250 mil arc of a tank can be observed without rotating the turret.
2. Secondary Arcs cover the area of responsibility of Adjacent Platoons.
3. Depth platoons cover the Rear and Flanks.
4. This system makes for great concentration of fire on a narrow frontage and is best suited to enfilade positions. In a frontal shoot either the criteria must be relaxed or positions will lack depth and probably there will be fire gaps within platoon areas of responsibility.

Figure 18. Arcs of Fire.

Section C Sequence for Adopting a Defensive Position

8. BATTALION ORDERS. The tank company commander receives his orders from the battalion commander either by radio or in person depending on the situation. He is given both the company mission and details of coordination with adjacent units. The company commander then estimates the situation from a map or the ground.

9. RECONNAISSANCE. If not in contact with the enemy, the tank company commander, accompanied by platoon and attached unit commanders, makes a reconnaissance of the company sector and attempts to site his tanks according to the procedures outlined in paragraph 4. He makes a plan which includes the following:

a. Company and platoon boundaries.

b. Tank primary and alternate firing positions.

c. Individual tank and platoon arcs of fire.

d. Positions and arcs of fire for attached units.

e. Means for securing flanks and gaps by artillery fire or construction of obstacles.

f. Priorities for engineer work.

g. Use of night vision devices.

If physical reconnaissance is prevented, it may be limited to an estimate from a map.

10. COMPANY ORDERS AND COORDINATION.

a. Following his reconnaissance the company commander estimates the situation and issues oral orders to the tank platoons and to attached and supporting units. In situations where the company is in contact with the enemy, orders are transmitted by radio on the company net.

b. Following final organization of the defensive position on the ground, the company commander sends a diagram of his company's position to the battalion commander. This diagram (Figure 20) includes the following details:

(1) Prominent terrain features and a scale.

(2) Enemy positions.

(3) Tank platoon and attached subunit locations and alternate positions.

(4) Primary and alternate directions of fire.

(5) Obstacles.

(6) Location of company headquarters.

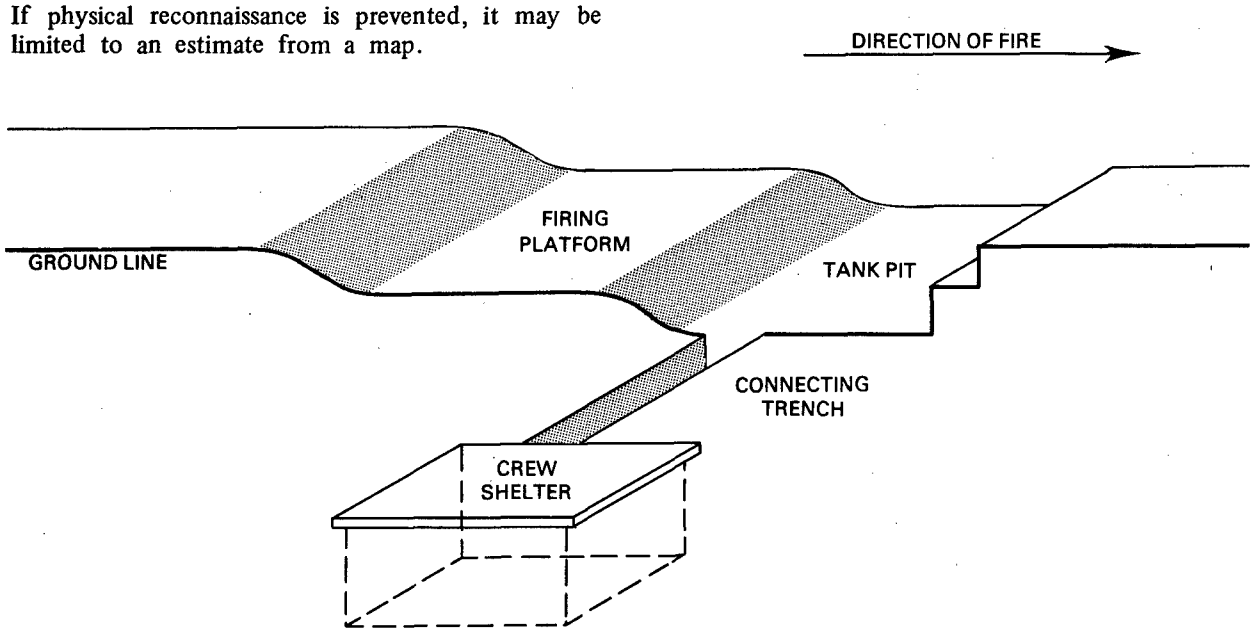


Figure 19. Engineer Prepared Tank Firing Position.

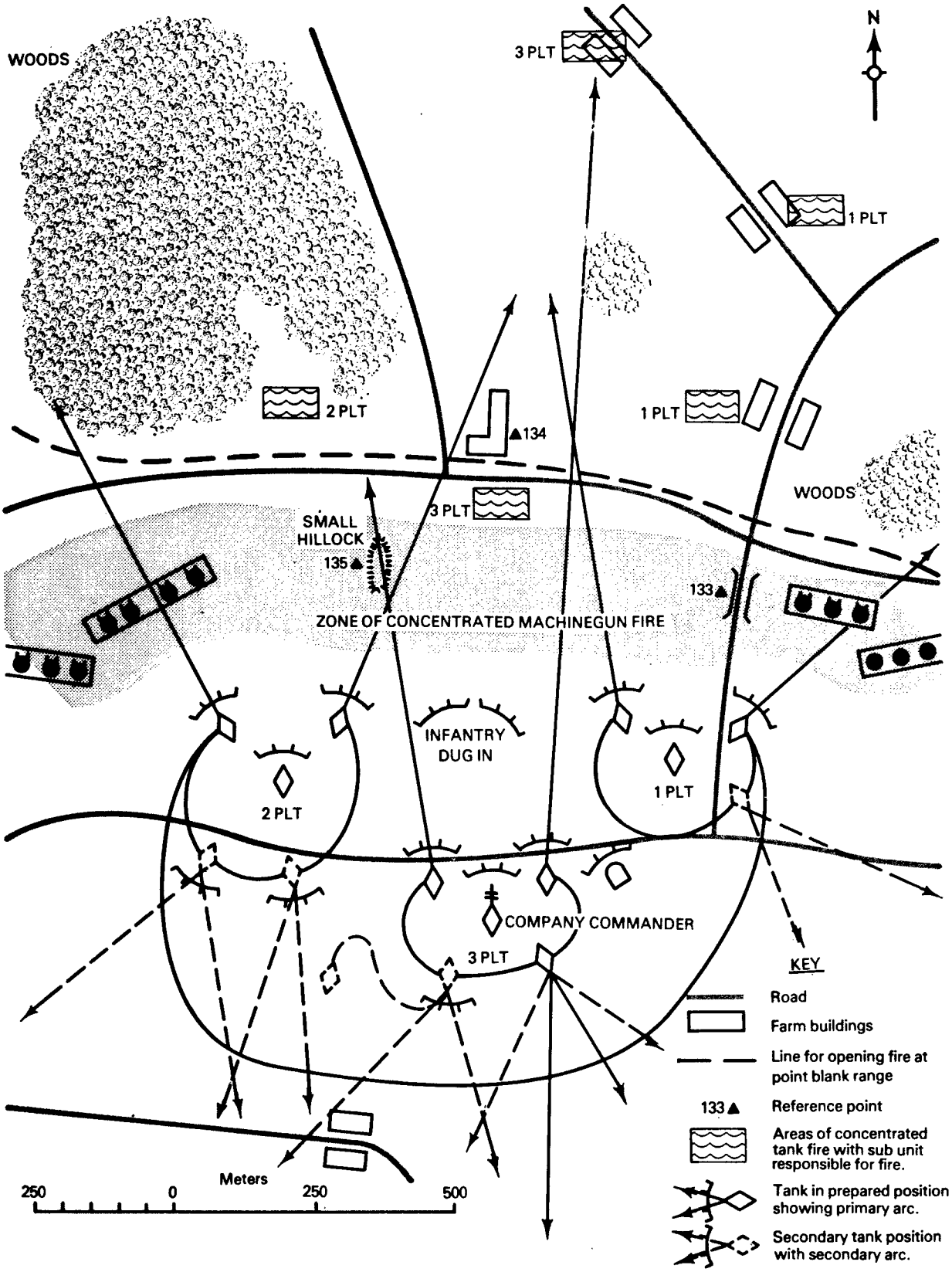


Figure 20. Soviet Tank Company Commanders Sketch of Defensive Positon. (Based on Soviet Diagram.).

11. ENEMY PROBES.

a. The Soviets consider that the enemy might attack initially using probing actions to locate tank firing positions. These probes will be followed by tank attacks supported by mechanized infantry. They expect that the enemy may use tactical nuclear weapons and will use an artillery preparation prior to the main attack.

b. The tank company commander details a tank to engage enemy probes so that the main firing positions are not detected. This tank designated in Soviet terminology "the wandering tank" moves and fires from within the company position. During this period readjustments of the company position caused by enemy nuclear or artillery fire are made. After a readjustment of his position, the company commander rechecks communications with both his own and attached units and higher headquarters.

12. THE MAIN ATTACK.

a. When the enemy launches his main attack the company commander concentrates the greatest part of his tank fire on the most threatening portion of the enemy assault. Fire is opened when the enemy reaches the forward edge of the company area of responsibility (approximately 1500 meters). Key points on the company front are designated as areas of concentrated tank fire (see Figure 20). Attached infantry and machineguns engage enemy infantry and APCs with the aim of isolating the infantry from the armor.

b. If the enemy attack fails, the company commander may shift his fire power against units assaulting adjacent positions. If penetration is made into the tank company position, counterattacks are not attempted by the company. Surviving tanks remain in position and support counterattacks ordered by higher headquarters. Only on order of the battalion commander will company tanks leave their preassigned positions to join a counterattack. Similarly, penetration by the enemy into an adjacent position is countered by fire and not by counterattack. Counterattack is normally a function of the battalion or regimental reserve.

c. The company commander, with the approval of the battalion commander, may move tanks to alternate positions. This is to cause the enemy to attack vacated positions.

13. TANK COMPANY IN "RESERVE." A tank company in depth within the battalion position is frequently referred to in Soviet writing as the "reserve company." This company, as well as having a primary role to hold an area, will have secondary tasks of acting as a counterattack force. Two or three routes to the forward companies' areas are reconnoitered, and lines of departure are assigned. The routes are marked for night use. The "reserve company" is also responsible for defense against airborne assaults.

14. DEFENSE AT NIGHT. In night defensive operations, an illumination plan is prepared. Illumination is ordered by the company commander. Defensive and gunnery principles do not radically differ from those used during daylight. Recent developments in Soviet night vision equipment may mean that there will be less need for battlefield illumination.

15. ANTITANK SUPPORT OF INFANTRY. When operating as an antitank defense force subordinate to a motorized rifle battalion, a tank company deploys by platoons. Each platoon deploys within a motorized rifle company area or strongpoint. Reconnaissance is carried out by platoon commanders together with the infantry company commander. Tank platoon commanders give advice on the location and coordination of the antitank defense. The tank company commander remains with the infantry battalion commander during the defensive battle and acts as his antitank defense coordinator. Authority to move the tanks within the battalion position remains with the tank company commander.

16. COUNTERATTACK.

a. The mobility and firepower characteristic of armor make the tank company an effective counterattack force. In this role, a company is normally reinforced by motorized rifle troops. A tank company may be employed as the regimental reserve. In this role it occupies a prepared position in the regimental second echelon of defense. The company commander prepares routes into the forward battalions' areas, and designates lines of departure and firing positions. Routes are marked by signs which are visible at night. Depending on the time available, rehearsals are carried out on counterattack routes. Communications and fire plans are then coordinated with forward units.

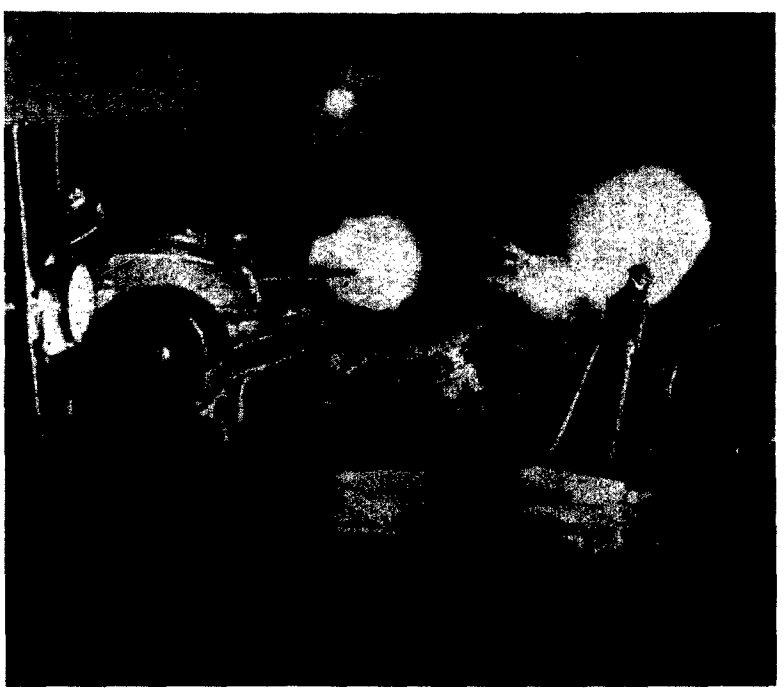
b. When counterattacking, a tank company fires "from place" and then, on receiving a signal, the company "rushes" the enemy. It is significant to note that, without the permission of the battalion commander, the company commander may not maneuver by platoon.

c. A regimental reserve tank company may be employed to occupy areas devastated by nuclear attack. Movement must be rapid. The commander selects the shortest trafficable route to the area and transmits orders to platoons during movement. In such operations the men are shielded from radiation by the protective liners of the tank and individual protective clothing. Increased monitoring is carried out by chemical specialists to prevent the company from moving into radioactive "hot spots."

17. TANK AMBUSHES.

a. Exposed flanks, gaps in defensive positions, and enemy approach routes can be sites for ambushes. The Soviets regard tank ambushes as effective defensive operations which may be carried out at platoon, company, or battalion level. Tank companies are usually reinforced by additional antitank weapons for this operation. The usual defensive principles are employed in siting tank ambush positions. They are in defilade and well camouflaged.

b. Both primary and secondary tank positions are selected. Positions are dug and fully prepared, if time permits, before occupation. Reference points are designated in the usual manner. Engagement ranges are at 1000 meters or less; surprise is the dominating factor in planning. Small groups of enemy vehicles are allowed to pass through the ambush site until a suitable target is selected. Ambushes are sometimes planned in order to capture arms, equipment, or enemy soldiers for intelligence purposes.



T62's conducting a defensive shoot on a field firing range. The light in the distance is probably a simulating device to indicate the target.

CHAPTER 14

THE WITHDRAWAL

1. CONCEPTS.

a. Soviet concepts allow withdrawal to avoid enemy nuclear strikes or to occupy a more advantageous position. In the defense the operation is carried out to reposition a unit's front towards a flank in response to enemy action or to reduce the length of a threatened supply line. During advance to contact, a withdawal can be ordered when stubborn enemy opposition is met or at the conclusion of an unsuccessful meeting engagement.

b. It is important to note that only a higher commander may order withdrawal. This is usually done to improve the tactical configuration or to free units for other operations. A withdrawal is usually carried out in face of enemy action. It is implied, however, that the enemy will not be allowed to dictate a withdrawal. A company withdraws as part of a battalion operation.

2. DISENGAGEMENT.

a. The critical time in the withdrawal is the break with the enemy. A tank company will attempt to break contact either at night or during conditions of low visibility. In theory, withdrawals will take place under cover of artillery and tactical air support. The support is planned at battalion level and coordinated in a regimental plan.

b. Once it has broken contact, the company moves to its new firing positions without intermediate positions. In cases where the unit is still in contact with the enemy, intermediate positions will be used as necessary.

3. ROLES. During a withdrawal, the tank company may be employed:

a. As a rear march security detachment.

b. As a lead march security detachment to lead the rearward moving column.

c. As a lateral march security detachment.

d. As tank ambush unit on enemy axes of advance.

In each case the company is usually reinforced by a motorized rifle platoon.

4. SEQUENCE OF WITHDRAWAL.

a. A company commander will receive orders from the battalion commander either in person or by radio, including:

(1) Tactical intelligence on the enemy.

(2) Mission.

(3) Coordination details for the withdrawal.

(4) Lines of deployment.

(5) Planned supporting artillery fire.

(6) Assembly areas.

b. A tank company withdraws to an assembly area 1 to 1.5 kilometers behind the FEBA. APCs withdraw, covered by tanks, into the assembly area.

c. If a tank company is in contact with the enemy, it may withdraw with platoons covering each other. Alternatively, the entire company may move simultaneously, covered by another company or the battalion reserve. Once the tank company has broken contact, platoons form into columns. A company column is formed once the company has passed through the positions of the rear march security detachment.

d. The withdrawal is deemed to be complete once the tank company is redeployed in a new firing position or has taken up a position with a battalion rear assembly area.

CHAPTER 15

SECURITY DURING HALTS

1. CONCEPTS. Analysis of combat actions shows that even in fast moving operations halts take place frequently. These halts may be momentary in order to fire, short term to cover other troops, or longer term stops to rest or coordinate planning and actions. No tactical reconfiguration is necessary for the shorter halts as tanks are likely to be in firing positions and have artillery support available. The purpose of this chapter is to describe security at longer halts, when there is no enemy contact.

2. CAMOUFLAGE AND CONCEALMENT. The use of sophisticated reconnaissance by the enemy, and the threat from air attacks, airborne assault, and nuclear attack, make camouflage and concealment the most important factors in the selection of halt areas. The Soviets emphasize that this must not impair the ability of tank units to defend themselves or to resume rapid offensive action.

3. LOCATION OF REST AREAS. A tank company normally occupies part of an 8 to 10 square kilometer area of its battalion. There is normally between 1 to 1.5 kilometers between each company within the battalion area. The combat situation and climatic conditions dictate the location used, but inhabited areas are avoided. The direction of march also influences the selection of individual positions within the rest area.

4. MOVE INTO REST AREAS. Areas are selected from the map by the battalion commander and a location is designated for each tank company. The battalion commander sends forward a reconnaissance party composed of battalion staff officers and company representatives. This party establishes the position to be occupied, having considered access roads, cover and concealment, minefields, and chemical and radiation hazards. The reconnaissance commander, having completed his task, reports to the battalion commander either personally or by radio.

5. OCCUPATION OF A REST AREA.

a. The battalion commander gives oral orders for the occupation of the position including:

(1) Tactical intelligence.

(2) Priorities for engineer work.

(3) Composition and missions of security units.

(4) Antiaircraft and nuclear defense plan.

(5) Alternative battalion area and routes to it.

(6) Communication plan.

(7) Location of the command post.

Orders are repeated for each company. If circumstances demand, this reconnaissance and occupation procedure can be shortened by the use of radio orders and the movement can be into unreconnoitered areas selected from the map by a higher commander.

b. Tank companies are met by subunit representatives and led into their designated areas. No halts on access roads to rest areas are permitted. Tanks are sited 30-50 meters apart. Sectors of fire for tanks and individual weapons are allotted, and foxholes dug by tank crews near their tanks. Vehicles are camouflaged as a priority task. If the position is to be occupied for any length of time, tanks are dug in and a telephone line is laid to the battalion command post. The company commander's tank is sited with the platoon in the center of the position. The platoons are 100-150 meters apart (see Figure 21).

6. LOCAL SECURITY. Local security is maintained by sentries and patrols detailed on a daily basis. In addition, platoons maintain observation posts (OPs). The OPs maintain antiair (AA), ground, and radio-watch. At night one man in each tank crew acts as sentry. A duty officer or sergeant mans the company commander's tank and remains in communication with the battalion headquarters, by radio and land line. A company OP is set up about 1500 meters from the company area in the most likely avenue of approach. A two-man patrol checks the individual sentries and OPs as detailed by the duty officer. Passwords and countersigns are changed daily.

7. SECURITY FROM AIR AND NUCLEAR ATTACK. By monitoring the battalion net, the duty officer is able to alert the tank crews of air or nuclear attack. Passive defense measures are taken by crewmen, who then man their vehicles and prepare their AA weapons. AA fire begins on order of the company commander. Low flying helicopters, or aircraft dropping or landing troops are engaged. When the nuclear attack warning is given, crews don their protective clothing and man their vehicles. If caught by surprise, crewmen are responsible for placing gas masks on the wounded and rendering first aid. After a nuclear attack, the company disposition is changed once wounded have been evacuated and damaged tanks recovered.

8. ORGANIZATION OF WORK IN A REST AREA. Company tanks are provided POL, ammunition and rations in rest areas. While in rest areas, routine or combat maintenance is performed on vehicles. Rehearsals and individual training are carried out when outside the immediate combat area. Crewmen are also given political indoctrination.

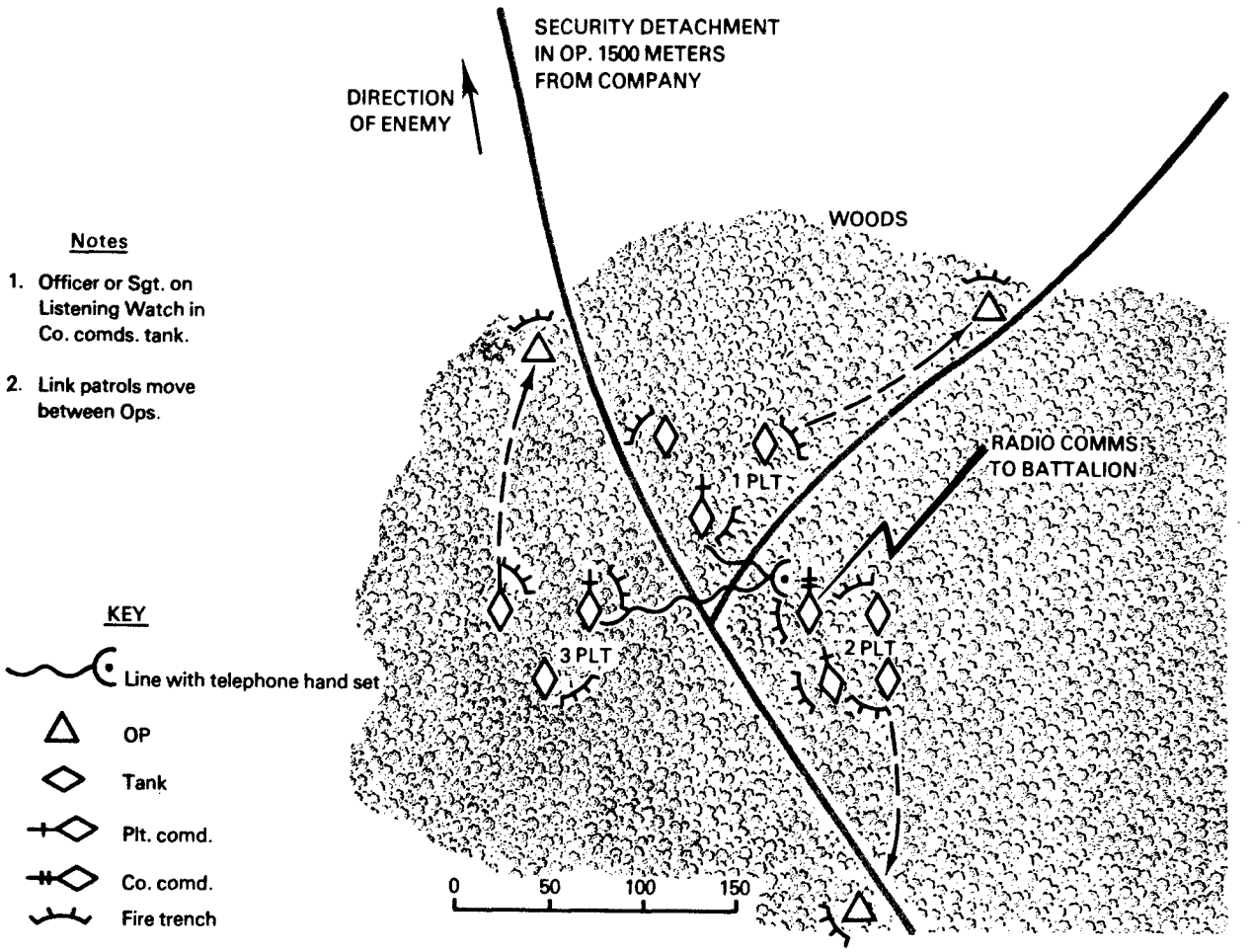


Figure 21. Company Security at the Halt.

CHAPTER 16

COMBAT IN BUILT-UP AREAS

1. CONCEPTS. Soviet doctrine states that built-up areas are bypassed when possible. When this course is followed, towns and villages are isolated and dealt with by second echelons. If a built-up area is vital to the Soviet commander's plan and first echelons are required to capture it, emphasis is on the destruction of the enemy defending the area. This method seeks to avoid the waste of time, manpower, and equipment required to capture such objectives. Operations in built-up areas lead to fragmentation of effort. These separate, combined arms operations are difficult to control, and require much more freedom of action than Soviet doctrine deems normal. The delegation of control inherent in urban operations calls for a higher standard of training than many junior Soviet commanders have yet attained.

2. EMPLOYMENT OF TANK COMPANY. A tank company can be employed in operations against an enemy in built-up areas in either the regimental first or second echelon. It is part of a combined arms combat group, and can be employed in one of the following roles:

a. Reconnaissance.

b. Security.

c. Assault force.

d. Close support of infantry.

e. Regimental reserve.

f. Defense.

3. COMBAT ORGANIZATION.

a. Tank companies are either reinforced or used to reinforce motorized infantry for operations in built-up areas. A typically tank heavy force designed to capture an objective in the outlying portion of a town would include:

(1) A tank company.

(2) One or two motorized rifle platoons.

(3) A mortar platoon.

(4) A howitzer battery.

(5) An engineer detachment.

b. Once in the environs of the built-up area, command of the operation probably passes to the commander of a motorized rifle company. A typical grouping might then be:

(1) A motorized infantry company.

(2) A tank platoon.

(3) A mortar battery.

(4) A platoon of antitank guns.

(5) An engineer detachment.

Grouping of forces will depend on the mission. The weight of firepower concentrated at company level is significant.

4. CONDUCT OF OPERATIONS. The Soviets attack built-up areas on narrow frontages. The assault frontage of a reinforced company might be 200 meters on the outskirts of the area. Within the environs of the built-up area, the company assaults along the axis of one main street. The artillery preparation is followed by infantry moving from building to building. The task of attached tanks is immediate fire support to infantry moving down streets. The tanks fire on enemy in the upper stories of buildings. The attack on a company front is based on the assault of a series of numbered objectives. Timing is tightly controlled. Artillery is used in a direct fire role.

5. THE DEFENSE. Defensive operations in built-up areas are based on a series of unconnected battles. Grouping is based on mission. Tanks are attached to infantry companies to provide anti-tank defense. Those tanks used as antitank weapons may be moved into buildings or engineer emplacements may be built, should time allow. A tank company can also be used as a mobile reserve. This reserve is kept in depth and moves to threatened areas through open areas. Except for the mobile reserve, defensive operations in built-up areas are unlikely to be fought as company operations.

CHAPTER 17

CONCLUSIONS AND AN ASSESSMENT OF THE COMBAT POTENTIAL OF A SOVIET MEDIUM TANK COMPANY

1. SUMMARY. Significant findings of this study, as they relate to the combat potential of a Soviet medium tank company are summarized below under the following topics:

a. Effectiveness of tactical concepts.

b. Command and control.

c. Effectiveness of training.

d. Effectiveness of organization.

e. Suitability of equipment.

2. EFFECTIVENESS OF TACTICAL CONCEPTS.

a. A tank company is prepared for combat in a war which the Soviets consider will be rapid in movement and short in duration. A tank company is trained to "rush" an enemy who is either on the move or has been neutralized by nonnuclear, chemical, or nuclear weapons. The intent is to seize the initiative and strike deep into the flanks and rear of the enemy. Soviet tank company tactics are based on attacking without lengthy preparation, concentrating forces, and rapidly exploiting a poorly prepared and weaker enemy. Attacks are delivered by successive echelons until objectives are secured. Defense is a temporary expedient during which the Soviets hope to weaken the enemy so that they will quickly be able to resume the offensive. In the defense, tank fire is concentrated on narrow frontages. A tank company may be used in any echelon or as a reserve for a regimental operation.

b. Under the circumstances defined, Soviet tactical concepts are effective. Against a balanced opposition with tactical nuclear weapons, or with parity in numbers, success in combat would be dependent on factors such as command and control, training, organization, and equipment.

3. COMMAND AND CONTROL.

a. The company commander and platoon commanders in a Soviet tank company are officers. In addition to their command duties these officers are tank commanders of their individual tanks. They are well trained in the technical aspects of their duties but are closely supervised by the battalion commander. They appear to lack initiative and experience. The company commander has the authority to call for supporting fires in combat. His authority, however, is restricted to maneuvering the whole company in well rehearsed combat formations. Platoon commanders react to the company commander's order and have no independence in tactical maneuver. There is a fifth officer in the company who has responsibility for technical matters, and some companies have a sixth officer with responsibility for political affairs.

b. The remaining tank commanders in the company are either *praporshchiki* (who have completed their conscript service and volunteered for a further term of military service), or conscript non-commissioned officers. A *praporshchiki* receives up to a year's training. A conscript tank commander receives six months specialist training. Non-commissioned tank commanders have sound training in the basic essentials of gunnery and target acquisition and some training in radio communications and tank driving. A tank commander's responsibility is restricted to fulfilling combat missions as ordered by the company commander and led by the platoon commander.

c. Tanks are equipped with radios, but only the company commander is given the unrestricted authority to transmit. Calls for fire support are channeled through the battalion commander. Communications with attached motorized rifle units are on a common net. Dismounted infantry have difficulty in transmitting to tanks due to the low radiation output of manpacked radiosets.

d. Maps are carried only by officers. Tanks are equipped with directional gyros which allow the commander and driver to maintain direction. Some command tanks are fitted with more sophisticated equipment which provides continuous data on map coordinates.

e. Soviet officers and non-commissioned tank commanders are well trained in the basic skills of maneuver, target acquisition, and gunnery. Junior commanders do not have the opportunity to show initiative in tactical exercise and therefore lack

experience. Their estimates of a combat situation are likely to be slow and sometimes faulty.

f. The communications system does not allow a tank company commander to control fire support or fully coordinate with dismounted infantry in a rapidly changing situation. Non-commissioned tank commanders do not have the means to relay targets of opportunity to fire support units since they have neither maps nor the authority to initiate radio transmissions.

4. EFFECTIVENESS OF TRAINING.

a. Soviet tank crews are well trained in driving, gunnery, and combat formations. One tank in the company is used for training purposes. Each member of the crew learns his duties by repetition until he can perform them to the required standard without conscious effort. There is heavy reliance in the training of drivers and gunners on simulators. Therefore, it takes crewmen some time to adapt to the irregular movement of a tank in motion. Subcaliber training rounds are used for gunnery training. The tank commander is trained to fire the gun but other members of the crew are not cross trained. Due to frequent rotation of conscripts, tank crews seldom remain together for more than a year.

b. Due to repetitive nature of Soviet training methods tank crews are unlikely to have their individual skills seriously degraded by the strains of combat. While the use of simulators allows frequent training sessions, time would be required for crews to become accustomed to their equipment. During this period the crewman would not be fully effective. The lack of cross training means a single casualty in a tank crew would often make the entire tank non-effective. Tank crews have limited experience working together because personnel are frequently rotated both in units and crews.

5. EFFECTIVENESS OF ORGANIZATION.

a. The combat element of a tank company consists of the commander's tank and three platoons of either three or four tanks. The company operates as an entity with the fire of all tanks under close control of the company commander. A company normally operates as part of its battalion, but can reinforce or be reinforced by motorized rifle units and artillery for specific missions. Combined training by small tank and motorized rifle units is fairly frequent. Though there have been difficulties noted in coordination, tanks and motorized rifle units are generally capable of coordinated operations.

b. The company is capable of rapid concentration of tank fire on targets which the company commander can identify. Firing by the tank company is not so effective, however, if the company commander cannot identify the target. In combat, a tank company is expected to continue conducting operations despite heavy losses.

6. SUITABILITY OF EQUIPMENT FOR LIKELY MISSIONS.

a. Soviet tanks are rugged, have a good main gun with an effective range of 1500 meters and machineguns which have an effective range of 800 meters. The gunnery control system is space oriented. Tanks are designed to fire both on the move and at the halt. Later models of tanks may have a built in protective liner to reduce the effects of nuclear radiation. Soviet medium tanks have the ability to cross water obstacles up to 5.5 meters in depth by snorkeling. The Soviet night gunnery technique requires the use of an active IR system or white light for target acquisition. The effective night fighting range for Soviet tanks is 1000 meters.

b. Soviet tanks are capable of carrying out in nuclear and nonnuclear environments the close quarter, day and night combat that Soviet tactical doctrine demands. Night fighting shortens the effective range of tank guns and requires the use of night vision devices.

7. AN ASSESSMENT OF COMBAT POTENTIAL. The Soviet tank company is organized, equipped and trained to fight as part of a battalion. Although it may on occasion be given a separate mission, it will have the close support of other tank and motorized rifle units and a considerable amount of artillery. The tank company is employed in such a manner that deficiencies in equipment, training standards and the command and control system can be compensated for by concentration of force. Offensive operations are continued until the enemy force is incapable of putting up a coordinated defense and is destroyed or withdraws. Within this concept the Soviet tank company is an effective fighting force with a high combat potential.

TANKS AND ASSOCIATED EQUIPMENT

1. SCOPE. This Enclosure provides details on tanks in Soviet tank units to preclude the need for reference to other manuals. More extensive details may be found in various DIA publications.

2. MEDIUM TANKS.

a. T34 and T44 tanks are obsolete, but are used for training. Many T34 chassis have been rebuilt as armored recovery vehicles which the Soviets designate T-34-T.

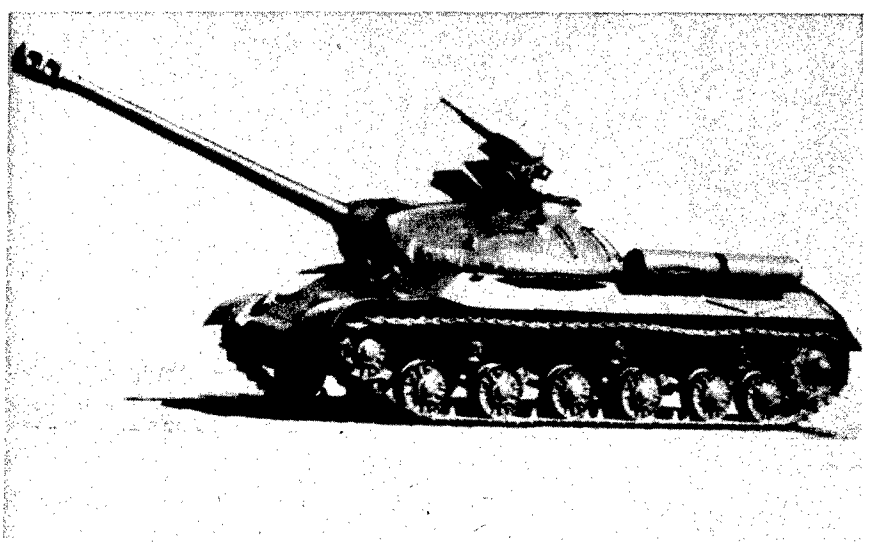
b. T54 tanks and the improved version, T55, are the most numerous medium tanks in service with Soviet ground forces at the present time. Both the T54 and the T55 have 100mm guns.

c. The T62 tank is an improvement on the T55. It has a 115mm smooth bore gun and fires HVAPFSDS and fragmentation ammunition as well as HEAT. This significantly improves penetration over the earlier models.

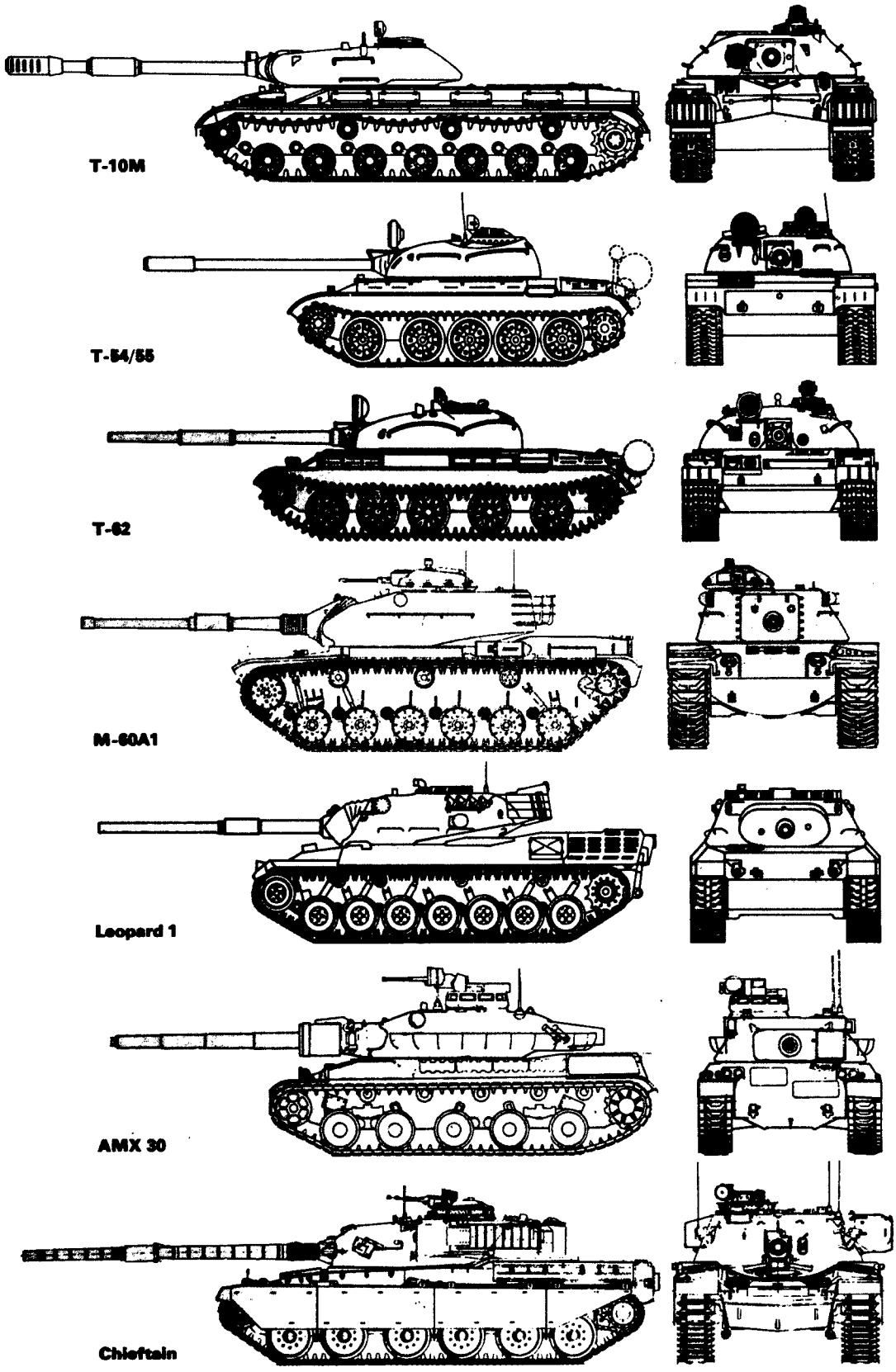
d. The T72 is the most recent addition to the Soviet tank inventory, it is superior in firepower and mobility to the T62. Although there are insufficient details of the tank known to include it in the table at Appendix 1 to this Enclosure a short comparison between the T62 and the T72 is included at Enclosure 4.

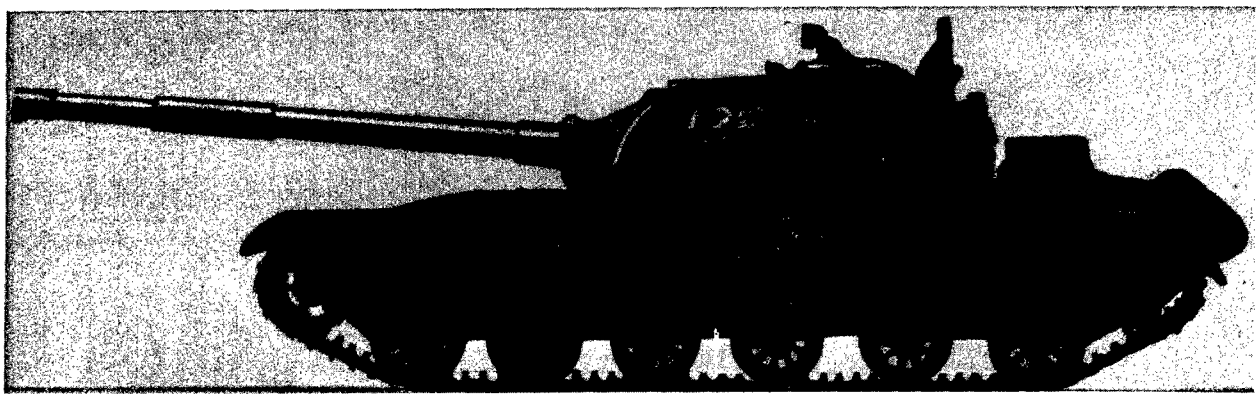
3. HEAVY TANKS. Some JS-2 and JS-3 tanks are still in service in GSFG. The T10 and T10M, post war improvements of the JS3, are also in service in battalion and regimental strength. It should be noted that although these are designated heavy tanks by the Soviets, they weigh approximately the same as the US and British medium tanks.

4. COMPARATIVE TABLES AND SILHOUETTES. Details of armament and performance for some Soviet tanks in service in medium tank and heavy tank companies are at Appendix 1 to this Enclosure. Comparative sketches of some Soviet and NATO tanks are at Appendix 2 to this Enclosure.



JS-3 Heavy tank some of which are still in service in Group of Soviet Forces Germany (GSFG).


T-10M
T-54/55
T-62
M-60A1
Leopard 1
AMX 30
Chieftain



Artist Rendition of T-72

TANK PERFORMANCE COMPARATIVE TABLE

Vehicle		JS3	T10	T10M	T54	T55	T62
Weight cbt	ton	45.8	50	52	36	36	36.5
Length w/gun fwd	mm	9725	9875	10600	9000	9000	9770
w/gun rear	mm	8230	8550	9280	8485	8485	9000
w/o gun	mm	6770	7040	7040	6450	6450	6715
Width	mm	3070	3566	3566	3270	3270	3350
Height w/o AAMG	mm	2440	2255	2430	2400	2400	2400
Track	mm	2410	2600	2600	2640	2640	2640
Clearance	mm	460	430	430	425	425	425
Track width	mm	650	720	580	580	580	580
Ground contact	mm	4625	4600	4600	3840	3840	4150
Engine Model		V-2 IS	V-?	V-?	V-54	V-55	V-?
Horsepower		520	700	700	520	580	580
Cylinders		V-12	V-12	V-12	V-12	V-12	V-12
Fuel		Diesel	Diesel	Diesel	Diesel	Diesel	Diesel
Speed	km/h	37	42	42	48	50	50
Cruising range	km	150	250	250	400	500	500
Fuel capacity	L	520	900	900	812	960	912
Fuel consumption	L/100km	350	360	360	190	190	190
Trench	mm	2500	3000	3000	2700	2700	2800
Step	mm	1000	900	900	800	800	800
Slope	°	36	32	32	30	30	30
Tilt	°	30			30	30	30
Ford	mm	1300	1200	1200	1400	1400	1400
Armor: glacis plate	mm/°	120/55	120/60	120/60	100/60	100/60	100/60
upper hull side	mm/°	60/60	80/45	80/45	70/0	70/0	70/0
mantlet	mm/°	200 curve	250 basis	250 basis	170 basis	170 basis	170 basis
Crew		4	4	4	4	4	4
Armament							
Main armament	mm	122 gun	122 gun	122 gun	100 gun	100 gun	115 gun
Model		D-25			D-10T	D-10T2S	U-5TS
Basic load	rds	28	30	30	34	43	40
Elevation	°	+20	+17	+17	+17	+17	+17
Depression	°	-3	-3	-3	-4	-4	-4
Traverse	°	360	360	360	360	360	360
Axis of bore	mm	1950	1830	1830	1750	1750	1750
Secondary armament AA	mm	12.7	12.7	14.5	12.7	---	
Bow	mm	---	---	---	7.62	7.62	
Coaxial	mm	7.62	12.7	14.5	7.62	7.62	7.62
Basic load 12.7mm	rds	250	1000	---	500	---	---
7.62mm	rds	1500	---	750 (14.5mm)	3000	3500	3500

SOVIET LAND NAVIGATION AND NIGHT VISION DEVICES

LAND NAVIGATION SYSTEMS

The three types of land navigation systems used in the Soviet Ground Forces are:

a. Directional gyro driving aids

b. A map coordinate and direction indicator

c. Navigational system with map plotter

The latter system is not installed in tanks but may be used by some attached motorized rifle units. All three systems depend on a directional gyro; that is an instrument which is designed to accurately preserve an initial reference bearing during movement. The three systems are self contained, do not depend on emissions from electronic transmitters, and do not require space on the radio wave band. The systems are not susceptible to intercept, jamming or other electronic countermeasures.

DIRECTIONAL GYRO DRIVING AIDS

The GPK-48 and GPK-59 are installed in some T55 and T62 tanks. The driver is only required to switch the instrument on, give it time to warm up, and set his heading to actuate the system. The GPK 48 was designed to give direction in snorkeling operations but has no built-in compensation to allow for the Earth's rotation. The instrument is accurate only for periods of 15 minutes without resetting. The more recently developed GPK 59 has a compensating mechanism and can operate accurately for up to 1 1/2 hours.

MAP COORDINATE AND DIRECTION INDICATOR

A computer and display navigation system known to the Soviet soldier as "the coordinator" is installed in some T62 command tanks. The system consists of six components, three of which require no access by the crew except for inspection. The system displays map coordinates in terms of northings and eastings rounded off to the nearest 10 meters. The vehicle heading displayed is in Soviet mils on coarse and fine scales. The instrument is 90 percent accurate. The instrument can be used to navigate within a 100-kilometer grid square once set.

A newer navigation system is also in evidence. This appears to be a vastly improved version of "the coordinator." The newer system permits operation within a 1000-kilometer grid square without resetting. The instrument displays plus and minus coordinates on one kilometer and 200-meter scales from the present location. The bearing to the destination is also shown on a separate dial.

TACTICAL USES OF NAVIGATION SYSTEMS

In addition to use in normal conditions, navigational systems can provide the capability for plotting a tank's position and heading:

a. While snorkeling.

b. At night or in conditions of reduced visibility.

c. In terrain without prominent features such as desert, tundra, or nuclear devastated areas.

Navigational systems also give accurate locations as an aid to command and control or resupply and provide datum points for fire coordination.

NIGHT VIEWING DEVICES

Precise information concerning the extent of Soviet night viewing equipment is sparse. Tanks have both infrared (IR) sighting equipment for the main armament, and searchlights that can be equipped with an IR filter. Targets can be identified up to 800 meters. There is a limiting factor in that use of active IR can betray the exact position of the user should the enemy be using IR sensors. This hazard will be readily appreciated by the Soviets in their night fighting. The use of IR binoculars by tank drivers is a regular feature of night training, and binocular-type passive IR sensors are extensively used by tank commanders.

Soviet tanks use the daylight gunsight at night using white light illumination when possible. The next step in the development chain is the production of an ambient light sighting device, and this may have been built into the T72.

ARMS AND EQUIPMENT - SOVIET TANK COMPANY

Tank Company in the Tank Battalion of a Tank Regiment

9mm Pistol PM	33
7.62mm Rifle AKM	12
SAM (SA-7) GRAIL (Gripstock)	3
Medium Tank T54/T55/T62	10
Truck Zil 130/131/151/157	1
Mine Clearing Plow Sets	3
Radios R 112	4
R 113/123	10

We believe each tank platoon has a minimum of one tank mounted DSHK 12.7mm machinegun for low-level antiaircraft protection.

T62 AND T72 TANKS

1. The T62 has a 115mm smooth bore gun and fires a fin stabilized shaped charge round with a high probability of a first round hit at ranges up to 1500 meters. The two-plane (horizontal-vertical) stabilization of the T62's gun cannot be fully exploited because of the low shock absorbtion capacity of the chassis. The T62 has no passive night vision devices and, therefore, has a low night combat capability.

2. The layout of the T62 also has some basic disadvantages. Due to the extremely compact nature of the tank, interior space is limited. The fuel tanks, engine, and ammunition are in close proximity. Auxiliary fuel tanks are on the tanks decks and have no armor protection. Although the flash point of diesel fuel is high, it can not withstand a direct hit. Fuel tank positions increase the possibility of an ammunition fire. Finally, the driver, gunner, and commander are virtually in a line and are likely to become casualties if a tank is penetrated from the front.

3. In 1970 a picture of a new tank appeared in the Soviet technical press. This was probably a prototype and was designated M1970 in the West. The production model has been designated T72 in some Western military journals.

4. The T72 has incorporated features made possible by improved technology and basic changes in design. The T72 is both lower and sleeker than its predecessors. There appears to be a radical change in the chassis design. The characteristic flat tank of the earlier medium tank series has been replaced by a track support roller system.

5. It is probable that a torsion bar suspension system has been used. These advances mean that the T72 is more stable than its predecessors.

6. The increased stability of the T72 indicates that the armament and fire control systems are probably stabilized effectively. The 115mm gun of the T62 appears to have been retained, probably to achieve standardization in ammunition. It is probable that a rangefinder, using the laser principle, has been incorporated. This significantly improves the first round hit capability beyond 1500 meters.

7. We have estimated the T72's night fighting capability from photographs of the M1970 which show two large pieces of equipment on the turret beside the gun mantle. One of these is probably a conventional white light or infrared searchlight. The other equipment could be a low light amplification device, possibly with a heat detector and an impulse searchlight, or a pure heat-sensing sight. This combination would mean that the same impulse searchlight could be used for illumination and rangefinding, but either system would not be completely passive. Even though either system can be classed as active, the chance of a target having time to take evading or counteraction is small.

8. The armor protection of the crew of the T72 has been increased by improving the shape of the bow and by making more gradual the inclined plane of the front slope of the hull. There is also some indication that the armor thickness on the front has been increased. The crew positions in T72 have probably been altered slightly, which will decrease the chance of multiple casualties from one round's penetration.

9. Some risk of fire appears to be acceptable to the Soviets, as fuel tanks still appear on the tank's deck.

10. In summary, the T72 shows improvements over its predecessor in mobility, target acquisition at night, and firing effectiveness. Its improved technological features have placed it among the most modern and effective tanks in service.

M1970 -- Considered to be a prototype for T72.

SOVIET CONVENTIONAL SYMBOLS

Tank. General symbol used to show a tank regardless of type.

Amphibious tank.

Moving tank.

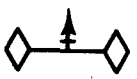
Command tank. The horizontal bars denote command level and may be used on any basic symbol.

One bar is for Platoon level.

Two bars are for Company level.

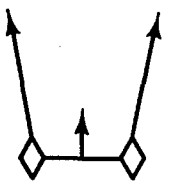
Three bars are for Battalion level.

Tanks in march column.

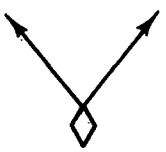


Tanks moving in combat formation.

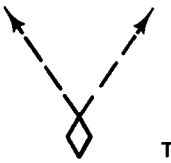
Tanks on firing line.



Tanks, moving in combat formation, showing primary arc of fire. The arrowed lines can be used to show the left and right limits of primary arc of fire by using one line at each extremity.



Tank showing primary arc fire.



Tank showing secondary arc of fire.

Moving columns of vehicles showing,

Tanks

APC's

Howitzers

Moving column of tanks showing projected direction of movement.

APC, general symbol showing an APC regardless of type.

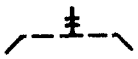
Moving APC.

Amphibious APC.

Amphibious APC, moving, carrying chemical specialists.

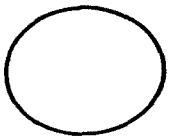
SOVIET CONVENTIONAL SYMBOLS

Motorized infantry in defense.



Frontage designated for occupation by motorized infantry.

Fire Trench.



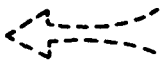
Area occupied by troops. Symbol inside circle denotes type and command level of unit.

Land line ending in telephone handset.

Water crossing commander.

Battalion Deputy Commander in command-observation post.

Direction of main effort.



Direction of main effort planned by a commander.

Basic symbol indicates radio communications or direction of radio communications.

Light truck.

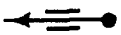
*Radio set operating on High Frequency.

*Radio set operating on Very High Frequency.

Booby trapped mine.

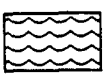
Anti-personnel mine.

Howitzer.



Howitzer unit moving.

*Howitzer target area.



*Areas of concentrated tank fire.

*Note these are not Soviet symbols but used for convenience.

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